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China—Market for Waste Products

Fabricating by Hand, the Chinese Utilize Materials Un-
suitable, Except as Scrap, for American Consumers
—Europe Again Dominates in New Materials

BY GEORGE S. HERRICK



CHINA has occupied a position of fluctuating importance with American traders. Since the romantic days of the clipper ships, there have been many changes in the export and import trade between the two countries. For a half century or more following the launching of the *Anglona*, the *Ariel*, the *Mazeppa* and the

Zephyr in 1841 and 1842, hardy New England skippers raced from the China Sea to Atlantic ports, heavily laden with cargoes of tea, silk, spices and other Chinese products. The clippers, long since passed into the pages of history, or into the yarns of battered and weather-beaten followers of the sea, have been supplanted by the modern steamship arriving and departing from American and Chinese ports with the regularity of clockwork.

The ships, the cargoes and to a certain extent the methods of transacting business have changed. The glamor of strangeness still seems to lurk in the export transactions. Of the Chinese custom of dealing with the foreigner through the "compradore," much has been written. The Chinese proclivity to barter over a price is familiar knowledge. There is one characteristic of business dealings with China, that is not entirely an open book.

The kind and grades of products consumed by the Chinese are known in a general way, but just what is meant by second-hand materials or what are the most acceptable types of off-grade or defective steel or what is the Chinese method of utilizing these products, for which they are in some instances almost the only consumers, is to a great extent known only to exporters dealing with China. In many cases they have learned the specifications by actual contact through years of residence in China and are not inclined to "broadcast" what is to them a large part of their stock in trade.

Even in the most active periods, the trade is largely a business in small tonnages except in the case of old plates, cuttings of plates and similar materials, orders for which will run from a few hundred tons to

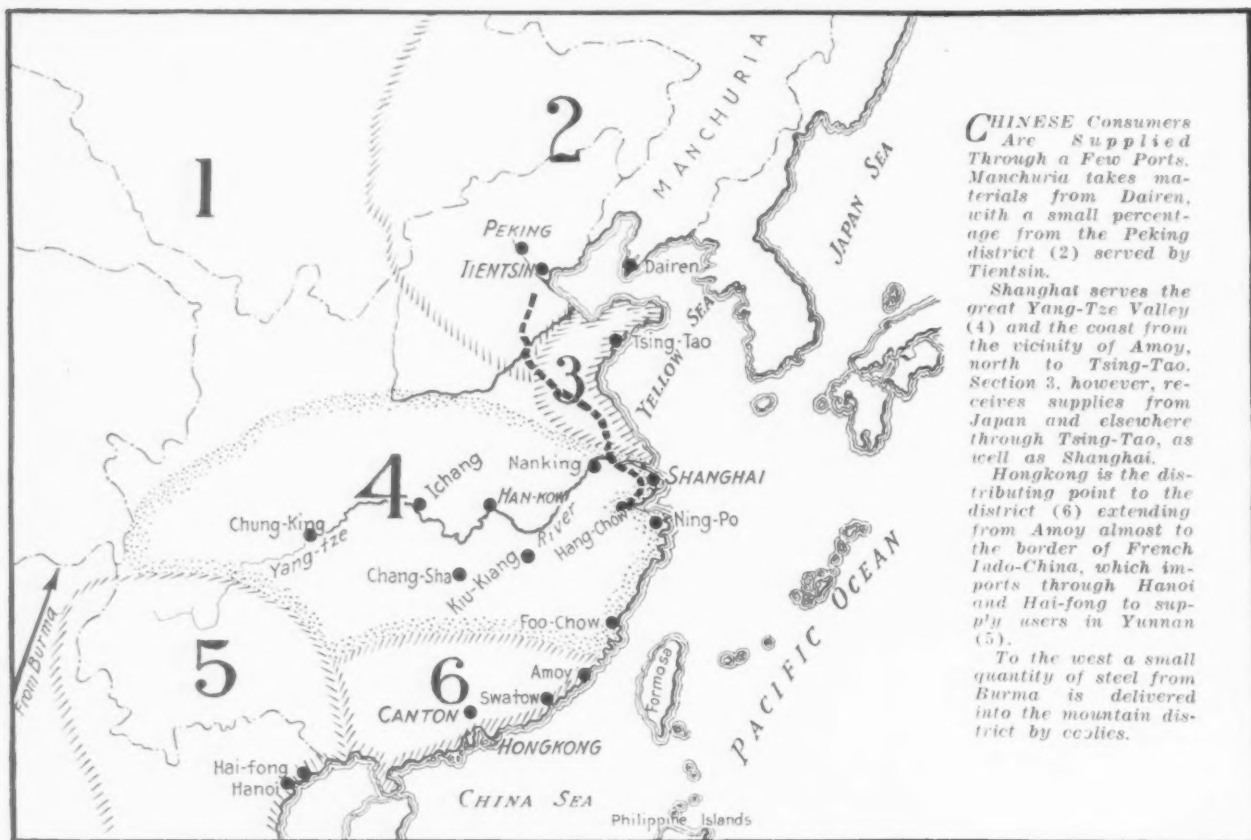
several thousand. Profits made on the smaller lots are commonly meager. An order for wire shorts will total from 30 to 50 tons and represent a gross profit to the exporter of \$1 a ton or less. At least one cable costing close to \$5 and occasionally two will be sent by a half dozen sellers competing for the business, so that the total expenditure of the competing companies is about equal to the possible profit to the successful bidder.

While demand for wire shorts is perhaps the best sustained of any, buying by Chinese merchants will include such other scrap or defective materials as bar crop ends, plate cuttings, second-hand plates, used chain, old wrought iron horse shoes, used files, hoop ends, defective wire rods, old enameled signs, old wagon tires (second-hand tire steel) tin plate wasters, tin plate waste waste and tin plate scrap. In new materials bamboo steel is the one product peculiar to the Chinese trade, with galvanized sheets and black sheets by the crate occasionally in active demand.

Bamboo Steel Peculiarly Oriental

Bamboo steel, a large part of China's requirements of which had been supplied by American makers during the war, was previously supplied under popular brand names principally by German mills, which have returned to the Chinese market as the principal suppliers of this material. While the requisite quality of all the second-hand and defective material purchased is softness, so that it may be the more easily forged by hand, bamboo steel ranges from 0.65 to as high as 0.85 per cent carbon and is forged and tempered for use in cutting tools, such as scissors, knives of all kinds, cleavers, drills, sickles and similar instruments. Occasionally, in making a large knife, the Chinese workman will forge the knife from soft steel, sweating or welding on a cutting edge of the higher carbon, tempering bamboo steel. The method is described by those familiar with the Chinese as quite similar to the early American manufacture of an axe head by the local blacksmith.

In testing bamboo steel the practical method is to a great extent substituted for the scientific. No specific carbon content is demanded as a rule, the quality required being a clean break of a bar, 34 in. to 36 in. long, dropped from the height of a man's head. The name of this carbon tool steel is taken from the appearance, the manufacturer rolling the bar with joints



CHINESE Consumers Are Supplied Through a Few Ports. Manchuria takes materials from Dairen, with a small percentage from the Peking district (2) served by Tientsin.

Shanghai serves the great Yang-Tze Valley (4) and the coast from the vicinity of Amoy, north to Tsing-Tao. Section 3, however, receives supplies from Japan and elsewhere through Tsing-Tao, as well as Shanghai.

Hongkong is the distributing point to the district (6) extending from Amoy almost to the border of French Indo-China, which imports through Hanoi and Hai-fong to supply users in Yunnan (5).

To the west a small quantity of steel from Burma is delivered into the mountain district by coolies.

and lines that give it the resemblance to sections of bamboo. Although the leading American export interest now ships a small tonnage of bamboo steel to China, sale of this product under brand names does not seem to have developed among American mills to any extent.

Among the popular German brands or "chops" are the Stag, Bear, Two Horse and Pig and Elephant. During the war period, when supply from Germany was shut off, several American brands developed into prominence, including the full sailing ship and the brand of Robert Grant, of New York, a double X. The bamboo joint of the United States Steel Products Co. was not established until about 1920, although the Steel Corporation had made bamboo steel through the war period of trade with China. The return of Germany to world markets has slowly edged the American product from China, as the market price under keen competition has slowly declined until today it is close to 3.10c. per lb., c.i.f. Chinese port. Some idea of the low level of prices on this product may be gleaned from a comparison with common carbon tool steel, which sells at 6c. to 7c. per lb., f.o.b. mill.

Apollo and Raven Sheets Preferred

In addition to bamboo steel, China is a purchaser of other new material, including galvanized wire, wire nails, mild steel bars, black and galvanized gas pipe, galvanized sheets and some structural material. With the exception of pipe and occasional purchase of sheets, much of the business of today goes to European mills. In purchasing galvanized sheets the most popular specification is 48 sheets to a 4¾-cwt. (532-lb.) crate, measuring 3 x 7 ft., with Nos. 38, 33 and 25 gages, 4 x 7 ft., also popular, to a crate of 560 lb. Plain galvanized sheets are principally in demand, although corrugated material is occasionally purchased. When the sheets are finally disposed of in small lots from the warehouse, they are generally sold by the picul (133½ lb.). There is also a fair market for stove pipe sheets.

In the Shanghai market, quotations are generally published on the two most popular brands of galvanized plain sheets, Raven, rolled by the Grovesend Steel & Tinplate Co., Ltd., Gorseinon, Glamorgan, Wales, and the Apollo brand of the American Sheet & Tin Plate Co. General classifications of English and American sheets are also made. As in Japan, galvanized sheets are extensively used for roofing purposes and in the

construction of side walls of small buildings, for store-houses and similar purposes. In 1924 the United States exported only 155 tons of galvanized and 38 tons of black sheets to China.

Nails Bought in Europe

When a Chinese merchant inquires for nails, the exporter correctly assumes that he is interested in purchasing countersunk, checker head wire nails of Birmingham wire gage. The only other type of nail consumed in any quantity is the cut nail. The countersunk, checker head wire nails are used in sizes of ¾, ½ and ¼ and 1 in. to 7 in. in the Northern districts of China, supplied by the Shanghai market and in sizes of ¾, ½, ¼ and ⅜ in the Southern districts, supplied through Hong-Kong and Canton. This difference in specifications between northern and southern China also appears in the method of ordering quantities, the North buying by the 100-lb. keg, the South demanding the picul keg of 133½ lb.

Since the armistice, the trade in nails, which the American exporter enjoyed during the war period and directly afterward, has to a great extent disappeared with the return to world markets of European steel producing countries. It is noteworthy, perhaps, that while the earthquake in Japan in 1923 resulted in a rather heavy demand on Chinese stocks of nails, which were the nearest available supplies for the devastated districts in Japan, practically none of the replacement business was received by American mills. This turn to European sources of supply since the war is particularly true of structural material purchases, the larger part of which are placed with European mills, particularly Belgian, at prices lately many dollars a ton under the American delivered price.

Always Interested in Wire Shorts

Of the so-called second-hand or defective materials purchased, wire shorts, galvanized and plain, are probably in more continuous demand than most of the other products used. A wire short generally consists of a coil of wire, ranging up to 40 or 50 ft., or short of a standard length. Occasionally a full standard coil will be included where the wire has been found defective. Lots are assorted, various gages being included in a single lot, as a rule. The most usual assortments of

shorts range from Nos. 6 to 16 gage, but quotations are generally posted in the Shanghai metal market on all gages from No. 1 to No. 15 and finer. Annealed wire shorts are in demand in gages from Nos. 16 to 25.

In wire shorts, unlike most other materials, the bulk of the trade is with the United States, where the mills make more serious efforts to meet the conditions. The larger part of the American exports is in galvanized rather than plain shorts, the United Kingdom making a very good showing in exports of plain wire shorts, particularly in the past few years.

Shorts are used by the Chinese for a wide range of purposes where American manufacturers, working with modern machinery, regard full coils of perfect wire essential for high rates of production. There is a small demand from consumers in the United States. This acts as a stabilizing influence on prices of wire shorts, keeping quotations from dropping to extremely low levels when the Chinese are not inclined to pay much. Prices will range from as low as \$43 to \$44 per ton, c.i.f. China, to as high as \$62 or \$63 per ton, c.i.f.

Tin Plate Waste Waste Used Largely

Possibly next to the wire short as a material in active demand by the Chinese consumer is tin plate waste waste, which has advanced to a position of relative importance in Far Eastern trade in the past year or two. Tin plate waste waste, of lower grading than tin plate wasters, but considerably better than tin plate scrap, consists of assorted gages and sizes of plate ranging from 10 x 14 in. to 18 x 28 in. and base weights of 70 lb. to 155 lb. and heavier, packed as a rule in 200-lb. cases. One of the larger tin plate mills estimates that it has available under normal conditions about 200 tons of such material per quarter and estimates of the annual available tonnage from all tin plate mills in the United States vary from 7000 to 8000 tons or more annually. Prior to the development of a market in the Far East (Japan is a larger consumer today than China) much of this business was confined to a Brooklyn, N. Y., iron and steel scrap dealer, purchasing lots from mills and reselling to the makers of small stampings from tin plate, cardboard mailing tubes, with tin plate tops and bottoms, and toy manufacturers. A small percentage of the material was exported at this time. The price ranged from 1c. to 1.50c. per lb. at the mill.

Discovery by the Chinese consumer that here was a type of old material particularly suitable for the manufacture of his product developed a demand and, some of the waste waste finding its way to Japan, Mitsui & Co., one of the foremost Japanese export and import houses, investigated its possibilities as a product for Japan. The result of this was contracts and a combing of the market by this company. It is claimed that it now has almost two-thirds of the total export business in waste waste. While Mitsui & Co. sell the product to both Chinese and Japanese consumers, the supply is so small and the demand so heavy that the Japanese users have brought the market to a higher point than the Chinese, offering today 3.40c. to 3.50c. per lb., c.i.f. Japan, compared with 3.20c. to 3.30c. per lb., usually the maximum offer from China. Unable to obtain sufficient waste waste, the Chinese have in some instances turned to tin plate scrap as a cheaper substitute and there is a fairly active interest in this scrap for shipment to China. The United States Department of Commerce credits China with having taken a total of 4805 tons of tin plate in 1924, but this figure would include all grades from primes to waste waste.

Blacksmith Is Tool and Utensil Maker

The majority of the tools, household utensils and agricultural implements used in China, particularly in the interior, where life is more primitive than in the large cities, are hand forged from scrap, providing a

demand by importers in Shanghai and other ports, who distribute to the local blacksmith or householder. In these small lots of all kinds of scrap and defective iron and steel, the prime requisite is sufficient softness to permit working by hand. Troop movements in the various revolutions prevalent in the past few years directly affect this distribution and their interference with shipping is reflected in the Shanghai market and other large centers of distribution by lower prices or refusal to purchase at any price.

Miscellaneous Materials Utilized

Second-hand plates, plate cuttings, bar crop ends, hoop ends, and round, square and semi-hard cobs are popular. All are quoted regularly at prices fixed by the Shanghai Iron Merchants' Association. From such raw materials, the Chinese workman fashions spikes, knives, often with an edge of bamboo steel, digging forks for turning the ground of his gardens, an implement with a handle about 6 ft. long and the tines turned down, hoes and numerous other tools and utensils.

About the only requirement of a piece of scrap, obviously, is softness and sufficient area free from holes or damaging imperfections to permit its being formed into a tool at a low price.

Chinese imports for 1924 on materials entering through Shanghai, the principal port, are small, for, as a Chinese importer expresses it, "1924 was a very harassing year for anyone engaged in the metal business, being by far the worst since the Boxer trouble. Since March (1924) one crisis after another took place, and only in December it began to be noticeable that conditions were somewhat improving." Heavy imports in 1923, based on the large demand from Japan as a result of the earthquake, decline in exchange of the Japanese yen, floods in North China, continual internal disturbances and civil war, general decline of world market prices, all contributed to the 1924 depression. The imports show 55,900 gross tons of new mild steel bars; 21,000 tons of wire nails; 75,000 tons of steel plates; 42,000 tons of angles, beams, hoops, channels, tubes, wire rope, brass and copper sheets, etc.; 2500 tons of bar ends and 61,000 tons of cobbles and scrap.

Exporter to China a Specialist

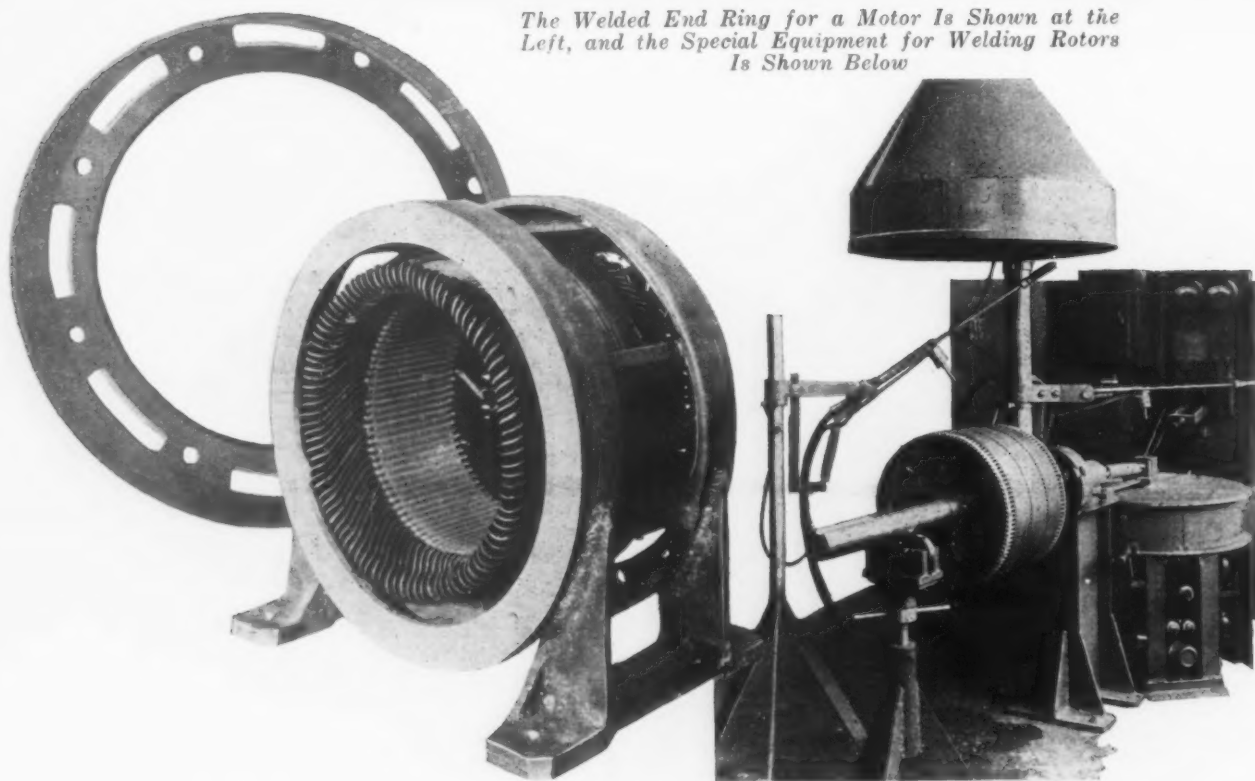
In one particular the iron and steel trade with China differs radically from trading with other foreign markets. With the exception of such organizations as Andersen Meyer & Co., which maintain warehouse stocks in various Chinese centers of distribution, making them, in a sense, exporters, importers and merchants, the American exporter deals with an import company operated and largely owned by American, British, German or some nationals other than Chinese.

The business is handled through foreign and native banks. The foreign banker finances imports up to the time the material leaves for the interior buyer, while the Chinese banker finances shipments from the time they leave the public wharf until payment has been received from the buyer at such distributing points as Nanking, Han-Kow, Kiu-Kiang, Chang-Sha, Ichang and Chung-King. There are theoretically four days of settlement in a year, the last day of settlement coming on New Year's, when all accounts must be closed. In practice, the jobber in the interior seldom is clear of indebtedness, carrying forward a balance from year to year.

In a measure the personal element enters into business transactions. The successful exporter in the United States is generally a man experienced with the requirements of Chinese trade, sometimes as a result of years spent in the Far East. In consequence he is trusted by the importer, as honest and with a proper understanding of the kinds and conditions of materials usable by the Chinese consumer.



The Welded End Ring for a Motor Is Shown at the Left, and the Special Equipment for Welding Rotors Is Shown Below



Costs Lowered by Arc Welding

Motor Manufacturer Applies the Process in Fabricating and Assembling Parts—Welded Steel Sections Replace Castings

A PLANT in which marked results in production work including lower costs have been obtained by the use of arc welding is that of the Lincoln Electric Co., Cleveland, which is using welding wherever it is applicable in the manufacture of electric motors, for welding both steel and copper parts and in assembling work. The number of welding operations that this company is doing in constructing motors may be taken as illustrating, perhaps, what the welding process offers to manufacturers of other lines of equipment.

End Rings Formed of Angles and Then Welded

The frame or end rings of a motor which were formerly castings are now made of standard angle sections. The angle is cut to length and then heated to a red heat, placed on a bending fixture, rolled into a circle and the two ends are welded together. Ventilating ducts required in end rings for large motors are made in the ring with a punch press. Angles in various sizes up to 3 x 5 in., depending on the size of the motor, are used. It is pointed out that not only is the steel ring much stronger than the cast iron ring, which has the disadvantage of danger of breaking in assembling or in service, but the former has the advantage of providing greater ventilating space for the admission of air to the motor windings. This has permitted improvements in the design of a motor to make it more efficient. It is stated that cast iron end rings require a cross section two and a half times greater than steel, thus cutting down the air passages within the motor.

The tie bars that fasten the end rings together, which are used only on the larger sized motors, are welded to the rings. The feet instead of being of cast iron and integral with the frame are made of steel sections cut out on a press and the parts welded together for the larger motors, and from drop forgings for the smaller. Both types are welded to the frame. A jig with a plane surface is used for holding the feet and stator during the weld so that the feet

are in proper alinement. After welding, the feet are ground.

The stator laminations after being stacked are put under hydraulic pressure between the end rings and are hot riveted together. The rivets are heated electrically and this riveting process is very similar to spot welding. It is stated that this method of assembling the stator could not be used with a cast iron frame because of the danger of breaking under the pressure used in drawing the laminations together, that the steel frame permits greater contraction when the rivets cool and that the process insures against loose laminations that cause noisy operation and chafing of the coils.

The rotor laminations are stacked between two steel end plates, clamped together and hot riveted, the windings or rods not being depended upon to hold the laminations together. Copper rods are inserted through the laminations and copper end rings are put over the rods, the ends of which extend slightly beyond the laminations. The end rings are made of strips of copper bent into circular shape, the ends being welded together.

Rotor Parts Welded By Semi-Automatic Machines

The rods and end rings of the rotor are welded together with a special semi-automatic welding machine, the work turning underneath the arc during the welding operation. A second adjoining welding unit is provided for making a weld around the edges between the rings, some types having two or three rings at each end. During this welding the rotor with its shaft is placed on two supports on which it is easily revolved. The electrode holders are water cooled to keep the temperature of the holders and carbons down and assure a good electrical contact. A hood above carries away the fumes. By the welding process the rotor rods and end rings are formed into one solid piece so that a perfect electrical circuit is assured. It is pointed out that improper unions between the rods and rings have

been responsible in many cases for poor operations or failure of motors. Another welding operation in connection with the rotor is attaching the ventilating vanes to the rotor plate.

Another part of the motor that is electrically welded is the oil ring. This consists of two dished steel rings welded together forming a deep groove in the center. This, it is claimed, carries several times as much oil as an ordinary ring and is much cheaper to make and better than a brass ring. The air deflector is made of two sheet steel stampings that are welded along the seam and then the deflector is welded to the cast iron end-bracket. Welding of steel to cast iron is generally regarded as a difficult operation requiring unusual skill but this welding is being done successfully. The company has designed an end-bracket of steel sections welded together and plans to substitute this for the cast iron bracket.

Various welding operations are employed by the company in making arc welding equipment. The exciter frame formerly made of steel pipe is now made of steel plate rolled in a circle and welded, and the lugs that hold it to the motor frame are welded. The seams of the compensator case and its fastenings are welded. The case for the no-voltage release coil as well as its handle fasteners and lugs attached to the stabilizers are also welded. Other welding operations include the conduit boxes for small motors, which are of No. 14 gage sheets, and the joining of parts of the electrode holders.

Steel Trucks Made Up of Welded Parts

The steel trucks for portable welding units contain no cast iron parts. Their frames are made of angle and flat bar sections welded together and the rear axles are welded to the frames. The wheels are made of steel disks. In making a wheel two disks and a steel rim, the latter rolled in a circle and the ends welded, are welded together. The hub is made of pipe welded into the wheel and fitted with roller bearings. The top frame is made of steel angles welded together. The motor base is of steel and is welded. The base of a gasoline engine welding set and various other parts of this set are welded. In assembling welding units various parts including the switchboard and starter box are welded to the parts to which they are attached. Various fixtures and tools used in production work are welded, resulting in a considerable saving in tool room costs.

Reclaiming Worn Steel Car Axles

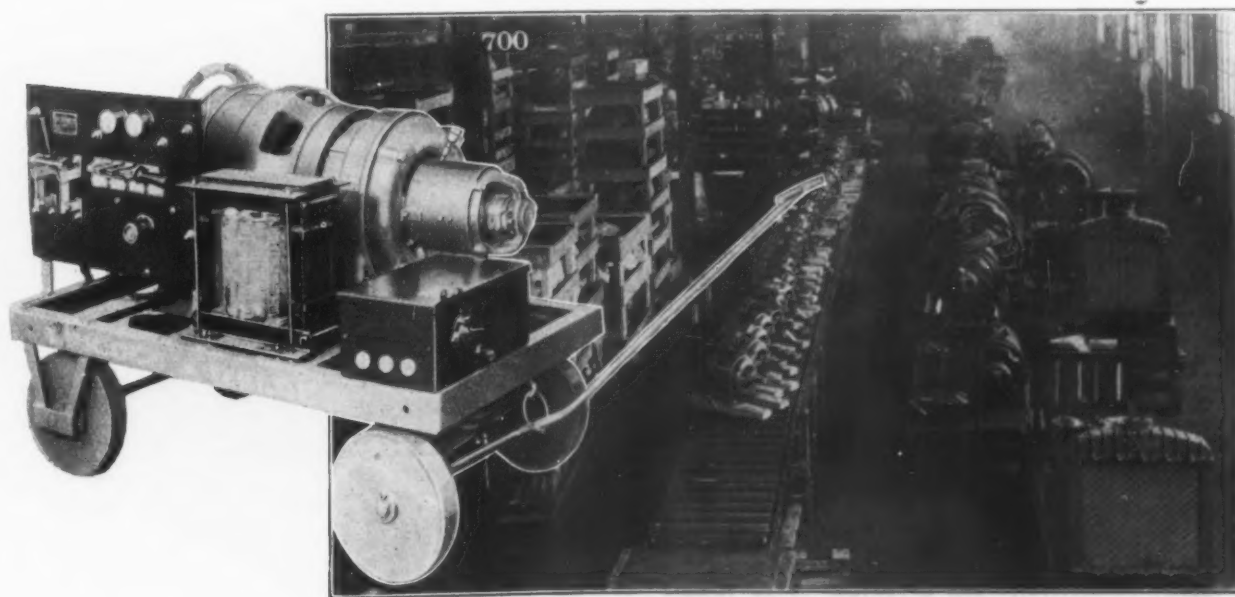
Doubling the life of steel car axles by reclaiming is covered in detail in an eight page pamphlet recently issued by the Ajax Mfg. Co., Euclid, Ohio. The practice is to return a worn axle to service as a standard axle of the next smaller size. For instance, a worn $5\frac{1}{2} \times 10$ -in. axle is salvaged as a 5×9 -in., or a 5×9 -in. as $4\frac{1}{2} \times 8$ -in.

It is claimed that the recovered axles are up to M.C.B. standard in all dimensions except in the middle, where they are oversize, and will stand all physical tests. It is further claimed that records show that the reclaimed axles give greater service than new ones before it is necessary to condemn them because of excessive journal or collar wear, and that in the past ten years not one reclaimed axle has failed in normal service. It was about ten years ago that, after conducting preliminary experiments, a large Western railroad went seriously into the business of reclaiming worn car axles. Since that date this road reports having returned to service about 30,000 scrap axles at an estimated saving of \$40,000 a year.

Fluctuation in the prices of new axles and their scrap value render a flat figure for cost of reclaiming practically impossible, but based on a recent run of 867 axles of various sizes figuring in direct labor, supervision, power and fuel, interest, depreciation and all other overhead items, the railroad under consideration estimated the average total reclaiming cost per axle at \$3.15. It was found that the average difference in price between a new and a scrap axle was \$14.61, so that deducting the cost of conversion, or \$3.15, the average saving per axle was \$11.46.

The Ajax company describes the equipment as consisting of two 4000-lb. double frame steam hammers, each with a special oil-burning furnace with locomotive boiler mounted overhead for utilizing the heat of the exhaust gases to generate steam for the hammers. One furnace has a capacity for heating four axles and the other six at a time. A 6-in. Ajax upsetting forging machine, equipped with special pedestal base plate back-stop, is used and an annealing furnace nearby heats 150 small or 90 large axles.

An X-ray diffraction equipment, by which the crystal structure of matter can be investigated, has been presented to Sir William Bragg of the Faraday laboratory of the Royal Institute of Great Britain, by the General Electric Co.



Portable Electric Welding Outfit in Which Welded Steel Is Used in Place of Cast Iron Parts Is Pictured in the Insert. The frame is of steel angles, the wheels are of steel disks with the rims welded together, and the handle is of welded steel bars

The Other View Is of the Plant of the Lincoln Electric Co. The motors move along a roller conveyor to the packing and shipping department. The portable electric welding units may be seen at the right

Auxiliary Equipment in Foundries

Devices for Saving Man Power—Material Handling and Conveying—Laboratory Control

KEEN competition makes the progressive foundry manager eager to secure every possible economy in the operation of his plant. Auxiliary equipment developed for the needs of the foundry is making possible large savings in labor, material and expense.

Continuous Molding for the Molder.—Some managers feel that a man hired as a molder should be continuously engaged at molding. To accomplish this end, pouring gangs had been installed in 16 of the 54 foundries visited.

One foundry went a step further and added the device shown in Figs. 1 and 2. This is a mechanical means of removing the completed mold from the molding machine to the pouring floor. The inclined mold-

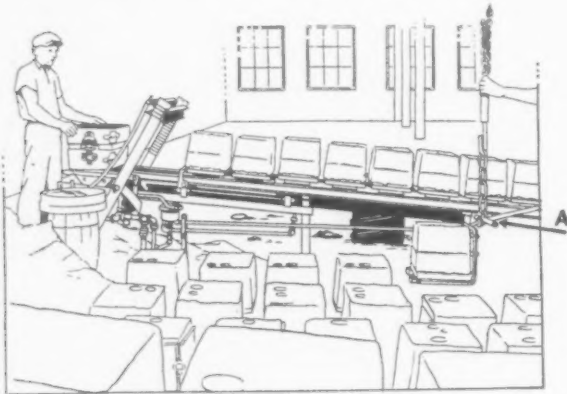


Fig. 1—Inclined Mold-Removal Device, Right Side. The piston rod, operated by air cylinder through a connecting mechanism, works the removing lugs. These two lugs, shown in final position on incline, have just removed completed mold from molding machine. Mold is then pushed slowly down the incline by other molds as they are completed

removal device, operated by a piston and air cylinder, moves the completed mold from the molding machine and places it on the incline shown in the photographs. A laborer removes the molds from the incline with the device shown at A in Fig. 1—a lever system and hoist suspended from a bay crane. One laborer attends to and pours two floors.

By this means the molder is relieved of lifting completed molds about the foundry, thus allowing him to devote all his time and energy to molding. The laborer is materially assisted by the lifting mechanism, and by a pouring device designed to relieve him of the weight of the molten metal and give him control of the pouring ladle with a minimum of effort. It might be mentioned that labor turnover at this plant was at a minimum, the management having eliminated wherever possible the back-breaking elements of a job.

Individual Cranes and Hoists.—Individual bay cranes or individual hoists are very helpful to the floor molder. A comparison of production under identical conditions (except that in one case an individual hoist was used and in the other case two laborers were intermittently engaged) demonstrates the advantage of an individual hoist.

NOTE:—This paper was prepared by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co., New York, as an aid to its group insurance holders operating foundries. It is the seventh in a series of ten descriptive studies of foundry management practices, the six earlier ones having been published in THE IRON AGE, at intervals during the past few months.

With the individual hoist, 14 molds were produced a day against only 10 molds where two laborers took the place of the hoist. The necessity of waiting for laborers, of discussing the mold, and the labor of lifting were avoided, adding four molds to the day's production. This is one of the many instances where individual hoists or cranes were found of material assistance in increasing output.

Raw Material Handling

Picture several laborers shoveling sand from hopper cars into sand bins or the same men unloading a car of pig iron, pig by pig, and you have a view of the yard in many foundries. In the article on Foundry Buildings (first of the series, THE IRON AGE, Nov. 20, 1924, page 1334), Fig. 1 illustrated how one foundry, employing 80 molders, has obviated the use of men for these laborious tasks.

In this foundry, cars are run into the storage shed on an elevated track. Sand is dumped from the cars into storage bins through hatches. Pig iron and scrap are unloaded by a traveling crane and an electric magnet. A clamshell bucket attached to the crane unloads coke. Pig iron, scrap and coke are piled on the cupola storage platform and conveyed thence to the charging floor on platform trucks. The number of men used in this operation is materially decreased. For those men who are engaged, the work required is principally the operation and direction of machines. Contented workers, low turnover of personnel on tasks ordinarily having high turnover, and lower costs are the results of this concern's efforts toward simplifying and systematizing tasks.

Charging the Cupola.—Contrast nine men, struggling to charge a cupola in Foundry A, with three men, loading twice the weight of material under right working conditions in Foundry B.

In Foundry A the equipment for cupola loading consisted of forks for handling scrap, an elevator, and wheelbarrows. The loaded barrows had to be pushed 100 yards from the storage yard to the elevator, over a runway covered with from an inch or more of dirt and mud. After reaching the charging floor, the coke, scrap and iron had to be handled several times before entering the cupola. In Foundry B industrial trucks conveyed unit charges, shown in Fig. 3, to the charging floor over paved runways.

Incidentally, it will be noted in Fig. 3 that the plat-

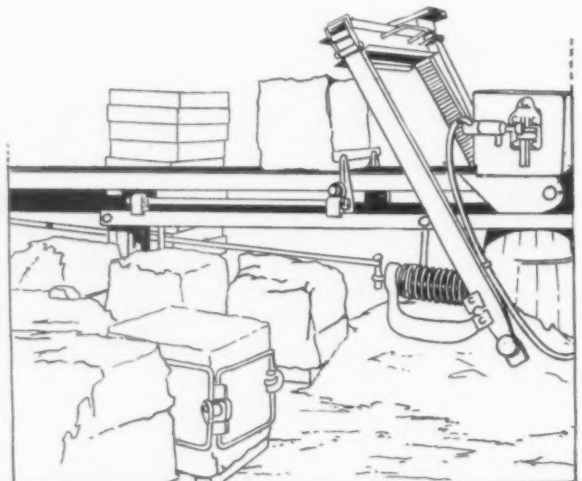


Fig. 2—Inclined Mold-Removal Device, Left Side

forms are elevated to a greater extent than required for the truck. This type of platform was adopted, to bring the metal to be loaded to the level of the cupola door and thus avoid additional lifting on the charging floor. Three men were enough to carry the material from the yard to the inside of the cupola and no extraordinary effort on their part was necessary to accomplish the task. The equipment had minimized the human effort required.

The management of Foundry B investigated new developments in the industry and adopted those which

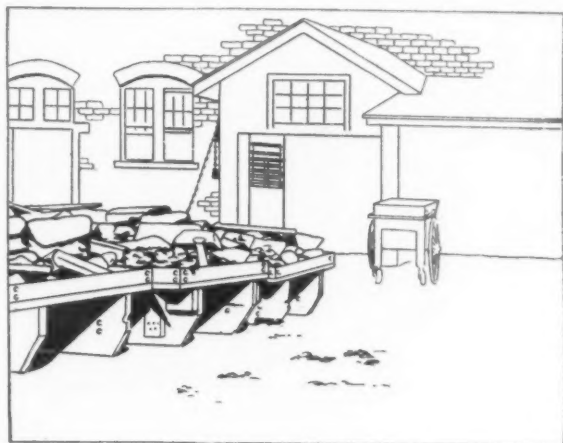


Fig. 3—Platforms With Unit Charges

had proved advantageous. Although it was one of the more advanced of the plants visited, its management was not yet content. Experiments were under way to determine the type of sand adapted to the needs of the foundry and the instructions to be given molders in the use of a particular sand. Laboratory control of charge and melt had established practical certainty as to the metal content of the casting, but the management wanted to control every factor in the making of castings.

Charging for High Output

Fig. 5, the charging device used in a foundry operating two cupolas and pouring about 300 tons a day, illustrates a means of reducing material handling. The bucket, designed to hold one charge, is placed on the scale receiver on the ground floor. Coke, limestone, iron, and scrap are dumped into the bucket from dump trucks and weighed.

Through the traveling crane, the bucket is elevated to the level of the charging door, and put in position for charging the cupola, then run through the door opening by means of the extended arm. The bucket is constructed so that the pull of a cord releases the bottom, which consists of two flaps hinged at the center of the lower surface, thus distributing the charge. Return to the platform automatically closes the flaps and prepares the container for another charge. Several handlings of material are eliminated by the use of this device.

Fig. 6 illustrates the use of a traveling crane (in this case a gantry) equipped with an electric magnet. It is the cupola storage platform of one of the larger automobile manufacturers.

Another type of crane used in several plants to handle raw material in the foundry yard is the jib or locomotive crane. This method of handling material is not limited to the large plant. A simple derrick rigged in the yard at a small foundry handled all raw materials expeditiously. Attachments used with the cranes and derricks are the electric magnet for handling pig iron and scrap, and a clamshell bucket for unloading coke and sand.

Conveying in the Foundry

Platform Trucks.—Platform trucks offer a flexible means of conveying material about the foundry. Of the 54 plants visited, nine used platform trucks. Both the storage battery and gasoline truck were in use. One

plant, part of which is shown in Fig. 3, used platform trucks for transporting raw material to the cupola, molten metal to the pouring floor, and castings to the cleaning room and shipping floor.

Daily schedules were worked out for the efficient use of the trucks. Interesting studies had been made showing savings over wheelbarrow methods, resulting from the use of platform trucks for foundry purposes.

Paved Runways for Trucks and Wheelbarrows.—Direct and efficient transport of material about the foundry requires that some form of runway be laid down in the plant. The use of trucks and, in fact, any wheeled conveyance not on tracks, presupposes a floor or runway adapted to efficient transit. Nine of the plants visited had cement floors, three had cement aisles with dirt floors, three had cast iron slabs for runways, and one used woodblock pavement for aisles in the portions of the foundry most traversed by trucks. The claims made for the block pavement were its ability to resist the crumbling experienced in the use of cement floors or runways, and the decreased cost of maintenance.

Other Conveyors.—Traveling cranes, industrial railways and overhead tramrail systems are other methods of conveying materials in the foundry. All plants having large floor work were equipped with traveling cranes designed and placed for transporting flasks, manipulating molds in the process of assembling, transporting molten metal in large quantities, and for moving finished castings from the molding floor to the cleaning room. Jib cranes supplemented the larger cranes, for smaller and more localized work.

Industrial Railways.—Industrial railways were found in 13 of the plants visited. The inflexibility of these systems within the foundry renders them generally inadequate to serve the needs of a plant. The tracks are a permanent obstacle in the foundry floor. In most of these 13 plants another type of conveyance supplemented the industrial railway.

Overhead Tramrail Systems.—Overhead tramrail systems are used in more and more plants as a means of conveying lighter loads. When designed for flexibility, that is, when provided with sufficient switching facilities to avoid the difficulties of a one-way system, the tramrail is commended by the foundry manager. Flexible systems reach all parts of the foundry and

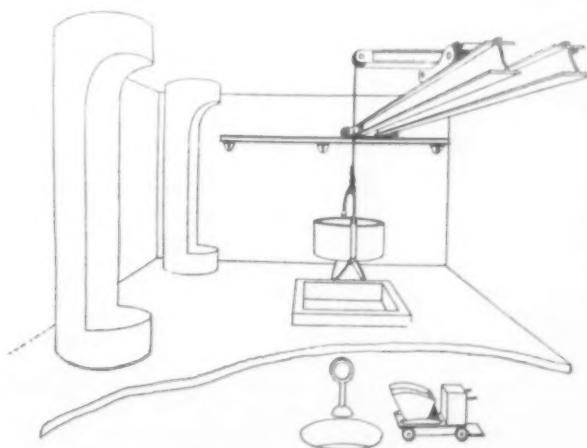


Fig. 4—Cupola Charging Device

permit ready transportation of molten metal to molding floors and castings to the cleaning room and the shipping room, as well as lightening the many other conveying tasks of a foundry. Condemnation of tramrail systems has usually resulted from an installation of faulty design, such as insufficient switching facilities.

Ventilating the Cleaning Room

Foundry cleaning rooms with white-washed walls which remain white are a possibility, although few exist.

One plant, which was operated on the industrial

(Concluded on page 120)

Possibilities of Industrial Heating

Electric Units for Wide Variety of Uses Rarely
Compete on Cost Basis—Uniformity of Product,
Easy Control and Low Rejections Claimed

BY C. L. IPSEN*

ANALYSIS of the heat and power required in manufacturing most products reveals that the energy required for heating greatly exceeds that required for power. Whether the electric heating load will ever equal the power load, as has often been prophesied, will depend only on the extent that electric heat will be able to supersede other heat sources. At present only the tendencies in this direction can be definitely stated. These tendencies can probably best be

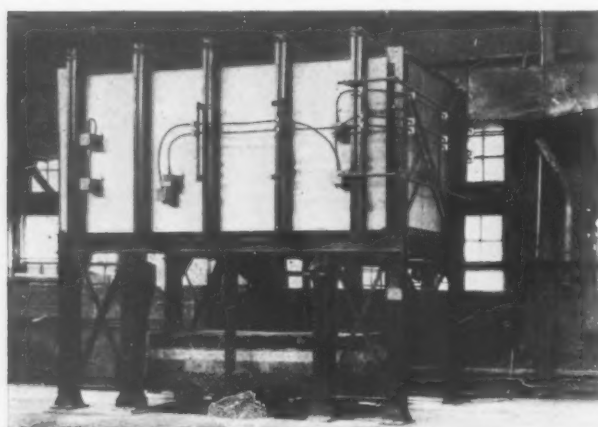


Fig. 1—Hydraulic Elevator Type Electric Furnace for Annealing, in the Punch Press Department of the General Electric Co. The car, after being loaded, is raised to position for annealing

brought out by considering the achievements of electric heating in individual applications.

Steel Treating

Heat is used in steel treating chiefly for annealing, hardening, drawing and carburizing. Fig. 1 shows an electric annealing furnace of the elevator type, for annealing sheet steel. The sheets are stacked directly on top of the furnace car, without the use of the annealing boxes familiar in fuel-fired practice, and the car is charged into the furnace by a hydraulic elevator. This type of furnace is used in preference to the more common car-bottom furnace with doors, for the air can be more effectively excluded and the furnace atmosphere controlled.

Since the heat in the fuel-fired furnace must be supplied by combustion within the furnace chamber, products of combustion are present which have a strongly oxidizing effect. Heavy steel or iron boxes, which in many cases exceed the weight of the material itself, are required to protect it from this oxidizing atmosphere. The fuel-fired furnace thus labors under the disadvantage of heating practically twice the material heated in the electric furnace, for a given output, and at the same time is charged with a high annealing box depreciation. These two factors have made it possible to reduce annealing costs materially with the electric furnace.

This advantage, coupled with other advantages of lower maintenance costs, more uniform product and

*Engineer, Industrial Heating Department, General Electric Co., Schenectady, N. Y. This is abstract of a paper presented at American Institute of Electrical Engineers Convention, at St. Louis, April 15.

better working conditions indicate that electric annealing of sheet steel is a field capable of great future expansion. Fourteen electric furnaces of this type, having a total connected load of 2200 kw., are now being operated by one concern.

Widespread adoption of electric melting furnaces during the past few years by steel foundries is now being followed by the general adoption of electric furnaces for annealing. Since annealing can be carried on without attendance, it is usually done at night, to secure the advantage of low off-peak electric rates. Advantages secured are better and more uniform product, less scaling and better working conditions.

A typical tool hardening room equipped with electric furnaces is shown in Fig. 2. Tool room furnaces are usually of the box or pot type and require an energy input of from 5 to 40 kw., depending on their size. These small electric furnaces have been found particularly useful for demonstrating purposes.

Uniform heating of steel throughout its mass to the proper temperature is essential, to secure maximum properties of hardness and strength. Even a slight deviation from these conditions will greatly reduce these properties, or may even cause the breakage of the tool or die in quenching. This marks the hardening of dies and tools as one field of the electric furnace, with its accurate temperature control and uniformity of heating.

These advantages can be secured without additional total operating cost, at average commercial rates for electricity. Accurate tests have been conducted in several plants to establish this point definitely. As undue prominence is often attached to the cost of fuel or electricity for heating operations, a careful cost analysis was made of several steel parts, showing that the cost

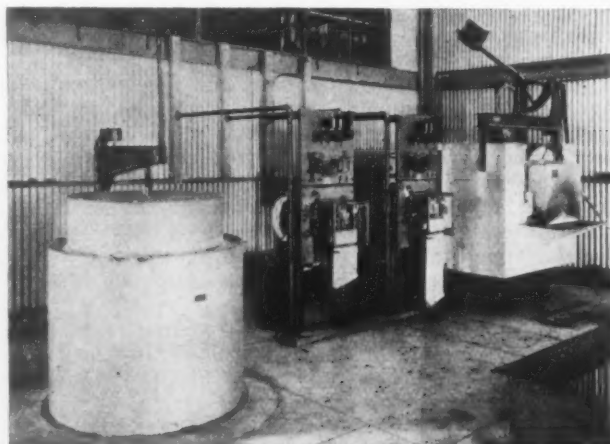


Fig. 2—Heat Treating Room for Oil Well Tools, with Vertical Cylindrical Furnace

of electricity used for heat treating averaged only 1/2 per cent of the factory cost of the parts. Improvements in these parts equal to many per cent could in most cases be credited definitely to the electric furnaces.

The advent of the automobile, with its requirements for lightness and great strength, has given great impetus to the heat treatment of steel. Some parts such as ball bearings are heated as often as six times dur-

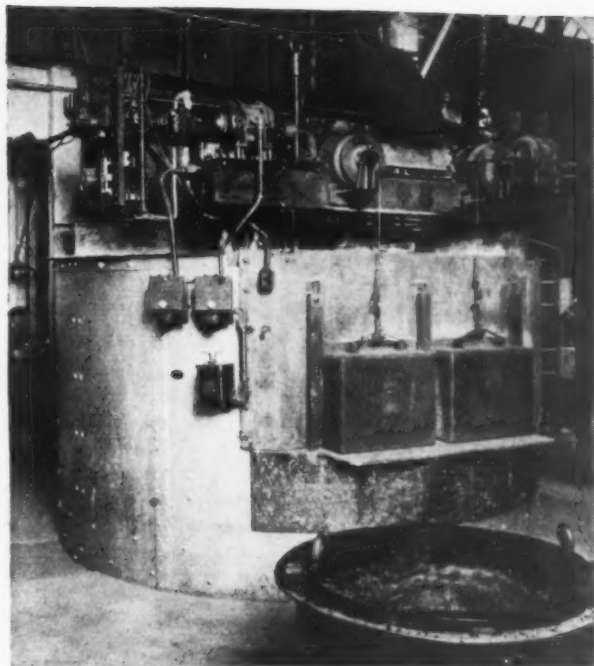


Fig. 3—Rotary Hearth Furnace for Metal Gears

ing their manufacture. The same care and accuracy in heating are required as for tools and dies and, accordingly, many automobile manufacturers are turning to the electric furnace.

Operation of electric furnaces, for this work, over a period of three or four years, has demonstrated clearly that maximum results can be obtained through their use and that these results can be obtained at a lower "over all" cost. In most cases the cost of electricity exceeds the cost of oil, but this higher "fuel" cost is more than offset by lower rejections, greater uniformity of hardness that makes possible the speeding up of subsequent machining operations, less cleaning, less labor and more favorable working conditions, which, in turn, results in lower labor turnover.

Continuous furnaces in which the parts are pushed or carried through and quenched automatically are used extensively for this work. Fig. 3 shows a rotary hearth furnace in common use for heating gears and small parts. A furnace of this type, installed by one concern four years ago, formed a nucleus for additions until now seven such furnaces are in operation, with a total connected load of 1200 kw.

Carburization of steel consists in increasing the carbon content of the surface of a soft steel part by heating it to a high temperature in the presence of carbon. The steel parts, packed in a suitable container with carbonaceous material, are heated in a furnace to the proper temperature and held at this temperature for several hours. Numerous installations of electric furnaces for carburizing have proved them able to compete successfully with fuel-fired furnaces on the cost basis alone. This is due to the high efficiency of the electric furnace during the long "holding" period.

Longer life of carburizing boxes, less labor and more uniform results are advantages gained by the electric furnace which promises to give great impetus to its future use in this field.

Copper and Brass Annealing

Working of copper and brass increases its hardness and reduces its ductility. With continued working the hardness of the metal reaches a point where any further reduction would cause it to break. It is necessary then to restore its softness and ductility by heating or annealing. In the manufacture of light gage sheet or wire it may be necessary to anneal several times. A final accurate anneal of some finished products is of vital importance. A good example is the copper used for electric motors and generators, where great ductil-

ity is required to prevent crystallization and breakage due to vibration.

An electric furnace for bright annealing copper wire is shown in Fig. 4. In charging the furnace the platform with its load of copper is lowered by a hydraulic cylinder into the pit filled with water. The furnace is mounted on wheels and, by means of another hydraulic cylinder, is pushed into position directly over the submerged charge of copper. Raising the platform to its original position thus places the charge inside the furnace chamber. Two platforms are provided, so that one may be unloaded and loaded while the other is being heated.

Heating units are mounted on the walls of the furnace, radiating their heat directly to the charge. Bright annealing is secured by keeping the furnace chamber filled with steam and thus excluding the air. Accurate temperature control and uniform heat distribution produce uniform results that can be duplicated in every heat. In the fuel-fired furnace steel muffles are required to exclude the products of combustion from the working chamber.

Lower costs and better and more uniform product are the chief advantages gained by electric furnaces of this type. One company has five of these furnaces in operation, with a total connected load of 900 kw.

For brass annealing a large tunnel type of furnace is usually employed. One such furnace with a connected load of 500 kw. has been in continuous operation for three years. The cost of electricity slightly exceeds the cost of oil, but advantages such as less scaling, more uniform hardness and lower rejections have made the "over all" cost in the electric furnace lower.

Vitreous Enameling

In applying the vitreous enamel coating familiar in lighting reflectors, kitchen ware and sanitary ware, the metal is heated to a high temperature to fuse the coating and make it adhere to the metal. The coating, consisting essentially of pulverized glass, is applied to the metal either as a thin paste or liquid, by dipping, or by dusting it, as a powder, on the hot metal. The former, or wet process, is used chiefly on sheet metal parts such as kitchen ware and the latter for cast iron parts such as sanitary ware.

Fig. 5 is a typical installation of the furnace used for enameling sheet metal. The chief requirements of the enameling furnace are: (1) High rate of production, since the labor of charging the furnace constitutes a large part of the enameling expense; (2) pure furnace atmosphere, to prevent contamination of the enamel; (3) uniform heating to the correct temperature, to maintain a high-quality product; (4) low maintenance cost, and (5) a minimum of interruptions in production.

To meet the requirement of a pure atmosphere it is necessary either to fire the fuel-fired furnace inter-



Fig. 4—Electric Furnace for Bright Annealing Copper Wire. The charge of 10,000 lb. is lowered and, after the heating chamber is pushed over it, is raised to position

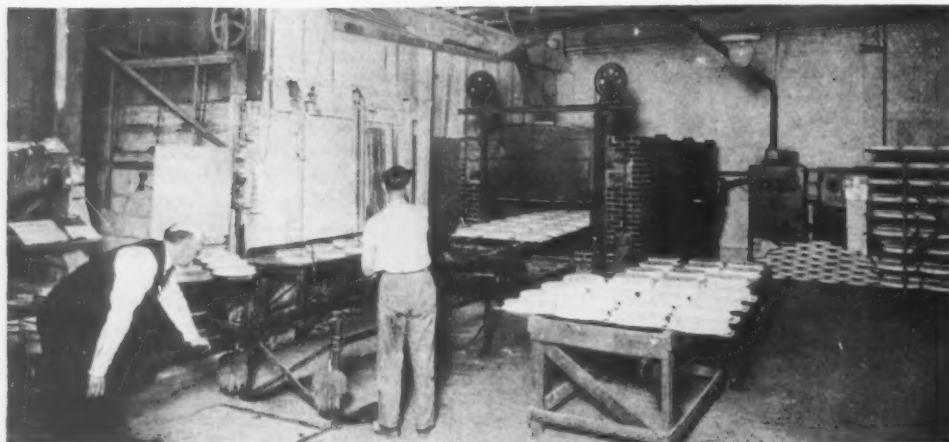
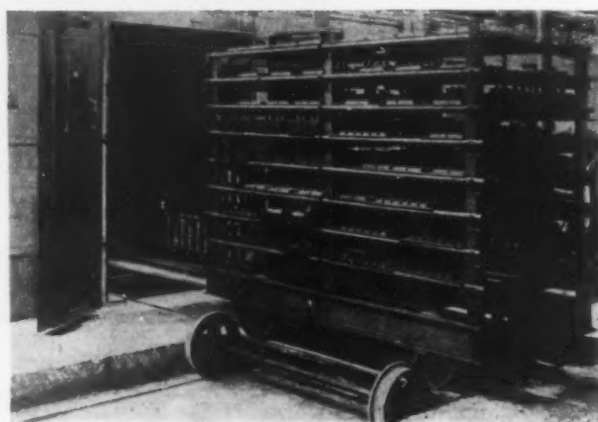


Fig. 5 (Left)—Vitreous Enameling Furnace with Working Chamber 4 x 10 Ft. x 2 Ft. High, at Plant of St. Louis Brass Co.

Fig. 6 (Below)—Truck Load of Cores Ready for Baking in One of the 18 Ovens at the Muncie Foundry, Muncie, Ind.



mittently while the furnace is empty, thus reducing production, or to interpose a muffle between the combustion chamber and the working chamber. This also retards production and gives rise to frequent interruptions and high maintenance cost.

On the other hand, the electric furnace ideally fulfills all these requirements. At average rates for electricity it suffers the disadvantage of a somewhat higher cost for heat. The large number of furnaces in operation have demonstrated, however, that in most cases other advantages of the electric furnace readily outweigh its higher heat cost and give a product of better quality at a lower "over-all" cost. One enameling company has, over a period of four years, increased its electric furnace installations to sixteen, with a total connected load of 3500 kw.

Baking Ovens

Development of low-temperature electric heaters for baking ovens preceded by several years the development of suitable high-temperature heaters for steel treating and other high-temperature applications. Accordingly, the low-temperature applications have been more fully developed and still represent the greater part of the industrial heating load, exclusive of arc furnaces.

The extensive use of japanned metal for automobile parts, furniture, typewriters, cash registers, etc., make the field of the electric japanning oven one of great importance. There are numerous installations through-

out the country, ranging from small box type ovens to great batteries of conveyor ovens. One company has a connected load of 12,000 kw. for japanning, which has been built up gradually to this point over a period of ten years.

On account of the superior quality of electrically baked cores, electricity is coming into more general use for core baking. Fig. 6 shows one of a battery of eighteen ovens used by one company. Another installation of 1000 kw. in core ovens is now in process of erection.

FABRICATOR ON DEFENSIVE

Aggressive Methods Needed to Meet Competition from Reinforced Concrete

Charles F. Abbott, executive director American Institute of Steel Construction, urged more aggressive methods upon the steel fabricating industry at the educational meeting of the institute held in Boston, June 24. In 1924, said Mr. Abbott, New York consumed 500,000 tons of structural steel, but not a dollar of profit was made by fabricators on this volume of business.

"It has been reported," he added, "that the present condition of the steel fabricating industry is due to excess plant capacity. That statement is incorrect, according to my belief. The real facts in the case which we should become familiar with are statistics and trend. During the twelve-year period ending with 1924 there was a decline of 4,000,000 tons in the use of structural steel. Since then the industry has been coming back a little."

Referring to the keen competition from reinforced concrete interests, Mr. Abbott insisted this must be met by more active methods. He pointed out that at Dallas, Tex., during the last nine months not a steel building has been erected. They have all been of reinforced

concrete, running in height to 22 stories. The steel fabricating industry is and has been on the defensive; it should be aggressive.

Mr. Abbott believes the institute can accomplish much toward the standardization of mill rollings. He stated the United States Steel Corporation is rolling 63 sections of structural steel, and the number could be cut down to 32 or 33.

The question was asked, "Why should we be forced to solicit business through the contractor?" This is one of the evils in the fabricating industry that should be eliminated at an early date. It was also urged that steel fabricators capitalize space on buildings being erected; that larger signs be used to let the people know who is erecting the steel.

To Complete Electrification of Donner Plant

BUFFALO, June 30.—Electrification of the entire plant of the Donner Steel Co. will be completed within the next three weeks, according to Frank R. Huston, vice-president, who announced that the 36-in. blooming mill will shut down July 3 to install a 5000-hp. motor. It will take three weeks to change the mill over. The 8, 10 and 14-in. bar mills and the 18-in. billet mills have already been electrified.

Surface Cracks in Rolling Steel

Eight Different Types Discussed—Their Causes and How to Recognize and Combat Them

BY HENRY D. HIBBARD*

[In an article, published in THE IRON AGE, June 25, the author discussed quite fully the effect of snakes on the finished rolled product. In this, the concluding portion, he takes up eight other possible causes of cracks in rolled steel.]

2. Cold Shuts

A cold shut is the result of too cold steel or a too slow rate of teeming or sloppy teeming, and is a break in the continuity of the surface metal due to the freezing of the ingot skin at that point before fresh molten steel flowed over and merged with it. If teeming is suspended for a time and then resumed, a cold shut is likely to be formed known in the shop as a "stop-pour."

Cold shuts in bottom cast ingots are horizontal. In top cast ingots they are sometimes extremely irregular both in form and manner of occurrence because of the freezing of splashes of steel against the mold walls, which causes them.

A cold shut in the ingot is likely to appear as a crack in the rolled slab or bloom, though it may of course be rolled out if not too large. It cannot be welded up, because it is oxidized inside, in the heating furnace and the temperature is not high enough. Sometimes, it is true, low carbon steels, when given a second hot-working are heated to a welding temperature in the second heating, but a cold shut is not likely to be obliterated thereby. It should be cut out of the bloom or slab before proceeding with the second heating.

3. Hanging in Mold

A crack or cracks are sometimes formed in an ingot which for any reason is held by the mold so that it cannot shrink freely. This may happen when the mold has insufficient taper, or is warped, or has roughness or cavities on its interior surface, or is cracked itself. Or it may happen when the steel has risen and overflowed the top and so formed a fin which holds up the ingot top. Or a fin may be formed between the bottom of the mold and the stool on which it stands which fin, cooling before the ingot body, prevents horizontal shrinkage by its greater strength and therefore causes the ingot to crack or be torn by its own contraction.

A crack caused by hanging in the mold is usually large, sometimes enough to break the ingot in two, or to make it do so in rolling. If due to the ingot hanging from the top, it will be in the upper part where the weight of the steel below it is the greater part of that of the whole ingot, and where, if the ingot is top cast, the steel, being the last to be teemed, is hottest and, therefore, weakest. A vertical crack caused by a bottom fin may extend up into the ingot 6 in. or a foot and be spread open an eighth of an inch or more.

Prevention of cracks from this cause lies in using only molds and stools which are in good condition. To prevent bottom fins, molds with closed bottoms which have already been referred to as a means of lessening the tendency to snake, may be employed.

4. Too Rapid Heating

A crack from this cause comes from putting a cold ingot of considerable size, or over 10 x 10 in. in cross-section, of rather hard steel into a hot furnace. Its outer parts are then too rapidly heated, and thereby

expanded, before the inner, which puts the latter under tensile stress. An ingot 16 x 16 in. sq. or larger, containing over 0.40 per cent of carbon, put in a furnace which is at or near the rolling heat, say over 1000 deg. C., may not be able to yield enough to relieve this internal stress, and may therefore be cracked transversely within about every foot of its length while the exterior may not be broken. Each crack as it is formed makes the ingot ring or "clink" audibly as if given a tap with a hammer. In rolling such an ingot the cracks, or some of them, may be extended to the surface, appearing first in the middle of a side or sides and extending usually clear through the ingot, while the corners may hold the ingot together throughout the rolling operation.

The prevention of this kind of crack lies palpably in not allowing the ingot to become cold between casting and rolling. If an ingot such as that specified above is cold, it should be slowly heated, preferably by cooling the furnace to a black heat or colder, depending on the size of the ingot, before the latter is charged in, and then bringing up the temperature of the furnace and its charge of ingots together to the desired degree for rolling.

The smaller the ingot in cross-section, the less liable it is to be cracked in heating. A large cold ingot of 3 ft. or more in diameter may require to be introduced slowly, a little at a time at intervals, even if the furnace be only black hot, to avoid internal rupture. Such an ingot of course is not rolled but is worked by a press.

5. Redshortness or Hotshortness

Steel with a redshort tendency may be cracked in the breaking-down operation because of its inferior ductility at the rolling temperature. Redshortness itself is sometimes caused by high sulphur but is almost always due to the presence of oxides or silicates in the metal. These impurities are for the most part so much non-metallic matter, much of which is locally segregated in the interfacial matter between the grains. The cure or rather prevention of redshortness which comes from these sonims is to make cleaner steel with fewer of them as has been often explained.

Cracks due to this cause are perhaps more common in mild steels than in those with higher carbon because the former are more likely to contain oxides. Unlike snakes these cracks do not exist in the ingot and they may occur anywhere throughout the length of the ingot and anywhere on a side or corner. They first appear during the first few passes through the blooming mill and in the sides which are vertical at the time in the roll pass where the metal is being stretched by the elongation of the metal in contact with the rolls above and below. They usually run in a direction across the ingot or nearly so. They may be few or many, according as the steel is less or more redshort, and may vary in size from small ones which are obliterated by the rolls up to those which cause the ingot to be broken into pieces in rolling, or if not that, to be relegated to the scrap pile. They may be as numerous as one developed every 3 or 4 in. of the length of the ingot in the first few passes through the rolls, without wholly destroying its commercial value, as they are in some degree smoothed out in the later passes or in a second

*Consulting engineer, Plainfield, N. J.

(Continued on page 124)

PREDICTS IMPROVEMENT

George M. Verity Expects Readjustment of Prices in the Fall

MIDDLETOWN, OHIO, July 3.—Improvement in conditions in the iron and steel industry should take place during the latter half of this year, according to George M. Verity, president American Rolling Mill Co., of this city, in an interview with a representative of THE IRON AGE.

"Producing companies in the iron and steel business," he said, "have been working under several handicaps. One of these is increased efficiency and capacity which has contributed its share to the weakening of the market. Another is a too intensive selling campaign."

"Fundamentally conditions are today as sound as everyone felt them to be last fall. The demand for sheet metal products during the first five months of this year has been exceptionally good. Business will of course be quieter during the summer, but there is every reason to believe that there will be further improvement during the next few months and that industry as a whole will be operating at a satisfactory rate in the early fall."

"I believe that we shall witness a readjustment of prices on steel products. Buyers of steel have been profiting for some time at the expense of the producer, but this cannot continue indefinitely without harmful results. Unless there is improvement in prices, producers cannot expect to operate permanently on the present cost scale. Readjustment of wages would be necessary. However, I believe that there will be a stiffening of prices so that present wage rates can be maintained and that the market will soon be in a much better condition than it has been for some time."

Trumbull Steel Co. Adding Another Steel Furnace

Foundations are being laid by the Trumbull Steel Co. at Warren, Ohio, for an eighth open-hearth furnace. The present complement of seven furnaces, of 100 tons capacity each, has proved insufficient to meet the requirements of the company's rolling mills when operating at capacity.

The company is also installing mixer cars to handle molten iron from the blast furnace of the Trumbull-Cliffs Furnace Co. to the Trumbull open-hearth furnaces across the Mahoning river. The tin mill plant at Leavittsburg, operated by the Liberty Steel Co., a subsidiary of the Trumbull company, is inactive this week for repairs.

Republic Company's Improvements at Birmingham

BIRMINGHAM, July 7.—The Chicago Bridge & Iron Works is erecting an elevated water supply steel tank for the Republic Iron & Steel Co. at its blast furnaces here. While other developments are under way by the Republic company, including a 57-oven by-product coke plant, development of coal fields, etc., nothing definite apparently has been decided as to the size of the open-hearth steel plant it will build or as to the character and scope of rolling mills to be installed.

Pacific Rolling Mills Plan Expansion

SAN FRANCISCO, June 27.—A four acre tract has been acquired by the Pacific Rolling Mill Co., Inc., at Kansas and Marin Streets, and plans are being made for the construction of a new fabricating shop and foundry at a cost of approximately \$750,000. The company's shop is now located at Seventeenth and Mississippi Streets, and has a capacity of about 1000 tons a month. The proposed plant will have a monthly capacity of about 2000 tons.

The Pacific Rolling Mill Co., Inc., was established in 1868 by the late James G. Fair and Leland Stanford.

The present management proposes to install in the new plant all of the latest machinery, which will give one of the oldest fabricating shops on the Pacific Coast the most modern equipment and facilities. The new plant will be fabricated by the company. Officials of the Pacific Rolling Mill Co., Inc., are: E. B. Noble, president; A. E. Wilkins, manager, and H. F. Hedrick, treasurer.

Freight Increase Held Up on Certain Items

WASHINGTON, July 7.—The Interstate Commerce Commission has suspended from July 1 and later dates until Oct. 29, the operation of freight tariffs which propose to increase the present commodity rates on steel described as "bolt, nail, rivet or wire rods," other than round, carloads, throughout official classification territory. Following rates are given by the commission on rods, other than round, as illustrative:

From Buffalo, N. Y., Rates per Gross Ton		
To	Present	Proposed
Cleveland, Ohio	\$2.90	\$5.60
Scranton, Pa.	4.41	6.27
Milldale, Conn.	5.50	7.39

More Steel Barges for the Mississippi

ST. LOUIS, July 7.—The United States Inland Waterways Corporation has decided to add a towboat and ten steel barges, costing \$1,100,000, to the present equipment of the Mississippi-Warrior barge service, which operates between St. Louis and New Orleans.

In the first three months of 1925 the line took in \$149,577 above its operating expenses, which after deducting sums for depreciation and repairs left a net profit of \$47,592. When the inland waterways corporation took charge of operation on June 1, 1924, the liabilities of the fleet were given as \$588,144 in excess of the assets. On April 1 of this year the assets exceeded liabilities by \$235,426.

The new craft will be built to draw only 27 in. of water when loaded, which will enable them to operate virtually all winter, when the Mississippi level is low.

Protests Freight Rates from Birmingham

CINCINNATI, June 30.—Southern Ohio iron and steel interests have protested to the Interstate Commerce Commission against the reduction in pig iron rates from Birmingham to Ohio River points which goes into effect on July 6. It is also reported that Chicago interests have voiced dissatisfaction with the new freight rates, which also apply on pig iron shipments from the Birmingham district to St. Louis and to Kansas City. It is unlikely that the Interstate Commerce Commission will suspend the new rates, according to advices received here.

Lake Ore Movement in June

Lake Superior iron ore shipments from the upper Lake ports in June were 7,958,486 gross tons, or 374,560 tons more than those for June, 1924, an increase of 4.94 per cent. The total season shipments to July 1 were 18,393,185 tons, which is 3,566,057 tons more than the season shipments a year ago, an increase of 24.05 per cent. The shipments by ports and for the season in 1924 and 1925 have been as follows in gross tons:

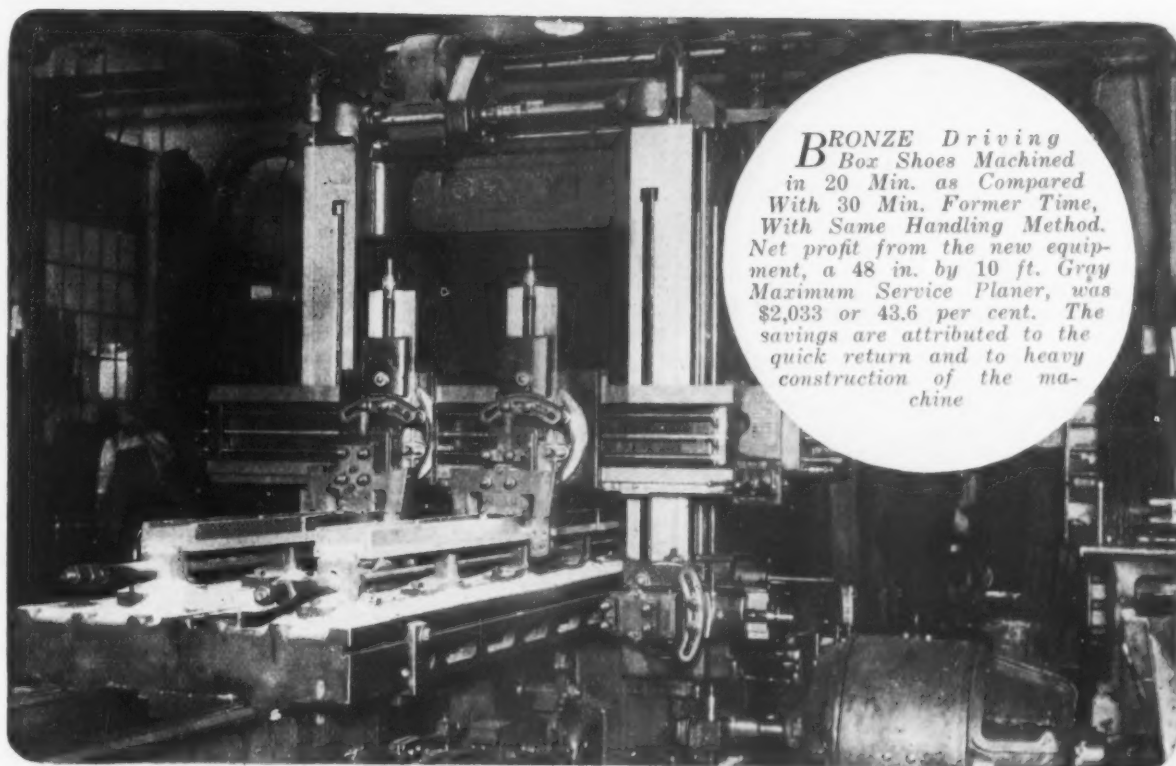
	June, 1924	June, 1925	To July 1	
			1924	1925
Escanaba	577,666	673,307	1,206,730	1,799,536
Marquette	403,938	434,440	657,163	950,816
Ashland	908,085	935,953	1,838,967	2,119,973
Superior	2,571,806	2,273,407	4,804,642	4,982,468
Duluth	2,212,340	2,801,562	4,488,294	6,421,034
Two Harbors	910,091	839,817	1,831,332	2,119,358
	7,583,926	7,958,486	14,827,128	18,393,185
Increase		374,560		3,566,057

Of the season shipments this year, Great Northern's proportion has been only 24.86 per cent compared with 30.16 per cent a year ago. Duluth's percentage this year has been 34.91 per cent of the total against 30.27 per cent last year.

Net Profits From Modern Equipment



THE Installation of a Grinding Machine Reduced the Time for Finishing Crank Pins from 45 to 20 Min. The additional investment for this equipment was \$2,545, the gross profits \$3,266, and the net profits \$2,757 or 108.3 per cent per year. The machine used is a Landis 16 by 72-in. self-contained plain grinder, which is adapted also to the grinding of axles, cross-head pins, and other parts. Grinding machinery is being used increasingly in railroad shops



BRONZE Driving Box Shoes Machined in 20 Min. as Compared With 30 Min. Former Time, With Same Handling Method. Net profit from the new equipment, a 48 in. by 10 ft. Gray Maximum Service Planer, was \$2,033 or 43.6 per cent. The savings are attributed to the quick return and to heavy construction of the machine

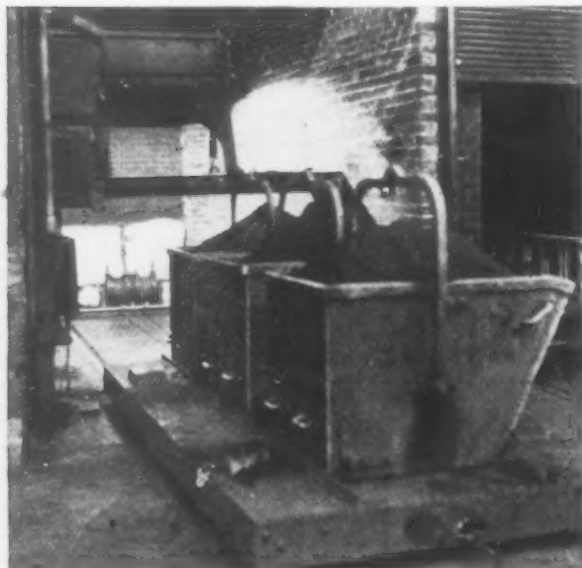
POWER and Rigidity Are Needed For the Trepanning Operation on a Locomotive Side Rod, Such as Shown at the Right. The work is done in 58 min., as compared with 540 min. by the former method. The additional investment in this equipment was \$4,660; the gross profits, part time operation, \$15,745; and the net profits, part time operation, \$14,811, or 317.8 per cent per year. The machine used is an American 6-ft. radial drill in which the spindle drive is by internal gear, eliminating chatter and vibration



Information on this page is from data collected by H. P. Bailey, assistant to the president, Warner & Swasey Co., Cleveland.

Pneumatic Hoist Handles Foundry Materials

A pneumatic hoist made by the Sullivan Machinery Co., Chicago, is used to pull a car loaded with rough castings from the molding floor to the cleaning rooms at the foundry of that company in Claremont, N. H. This hoist is made in either the single drum or double drum type, the one shown having a double drum. In this case the hoist is used to move the car only in one



Double-Drum Hoists Used in Pulling Foundry Loads. Above is a car of molding sand, in buckets, being pulled toward the reader by aid of a tail block. This sand is coming from mixing machine, the discharge hopper of which appears at upper left

direction, to avoid any obstruction on the floor at the opposite side.

Movement of the car from the cleaning room to the molding room floor is accomplished by an electric shop truck, as the car is empty on the return trip and light enough to be handled easily by the truck. The hoist is used also in the Sullivan plant to carry large buckets of sand from a sand mixer to a position where they may be picked up conveniently by the crane, and to spot railroad cars in the shipping department and in the sand receiving department.

The double drum hoist weighs 555 lb., or about 85 lb. per hp., is 29 in. long, 15 in. wide, and stands 19 in. high. The motor in its casing is supported on a central standard with a broad frame or foot, and supplies power to the two hoisting drums, each 11½ in. in diameter, with a 5¼ in. face. Each drum holds 225 ft. of 5/16-in. wire rope. A driving pinion at each end of the motor casting engages an internal gear in each drum shell. The capacities of the single and double drum hoists are the same—a load of 2000 lb. may be lifted vertically at a speed of 110 ft. per min. with 75 lb. air pressure. Sufficient air may be supplied through a ¾-in. hose to develop the rating of 6½ hp.

Switchboards Made of Sheet Steel

Light weight, strength and ease of erection are features of a new type of switchboard constructed of "stretcher level sheet steel," which has been developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, for use in industrial power railroad and marine installations.

Stretcher level steel switchboards have been used on small installations in a more or less experimental way for some time, and having proved successful are

now being installed on larger projects. Erection and maintenance costs are said to be lower than those of the slate and marble boards and the erection more simple, since the framework is an integral part of the panels. The steel panels are given a baked enamel finish, which in addition providing a pleasing appearance, is said to withstand moisture and resist the corroding action of salt sea air. An important installation of this equipment from the power and railway standpoint is in connection with the Staten Island project which is part of the complete electrification of the Baltimore & Ohio Railroad system from Baltimore to New York.

New Hack Saw Blade

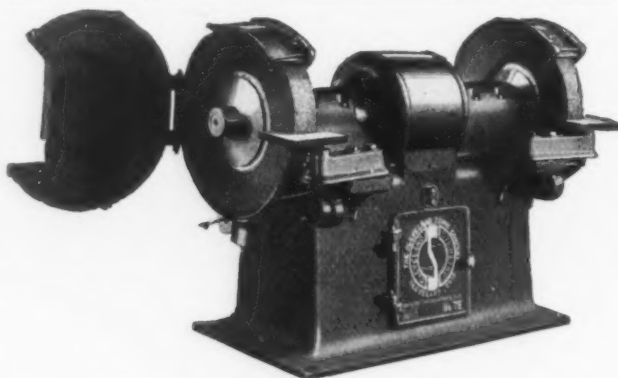
Under the name "silver steel blades," E. C. Atkins & Co., Indianapolis, Ind., have put on the market a new hack saw blade. The company states that it has developed a new type of steel for these blades as well as a method of heat treatment for tempering them, but the details are not given. While the cost is announced as over five times that of commercial quality hack saw blades, the company claims that they will last much longer and cut faster.

Hand Punch for Use in Close Quarters

A lever-type hand-operated punch known as the Imperial No. 8, and designed for punching holes up to ¼ in. in diameter in ¼-in. material, is a recent addition to the line of the Whitney Metal Tool Co., Rockford, Ill. A feature of the device is that it can be operated in close quarters, punching within a 90-deg. movement of the handles, and on work such as standing seams, stack work and skylight work. The handles are drop forgings and are heat treated. Positive stripping action is a feature, as well as the use of roller bearings to offset friction.

Heavy Grinder for Foundry Use

A heavy-duty floor grinder for foundry use has been placed on the market by the Cleveland Stone Co., Cleveland. The machine is driven by a special 10-hp. 900-r.p.m. Lincoln motor and carries two grinding wheels,



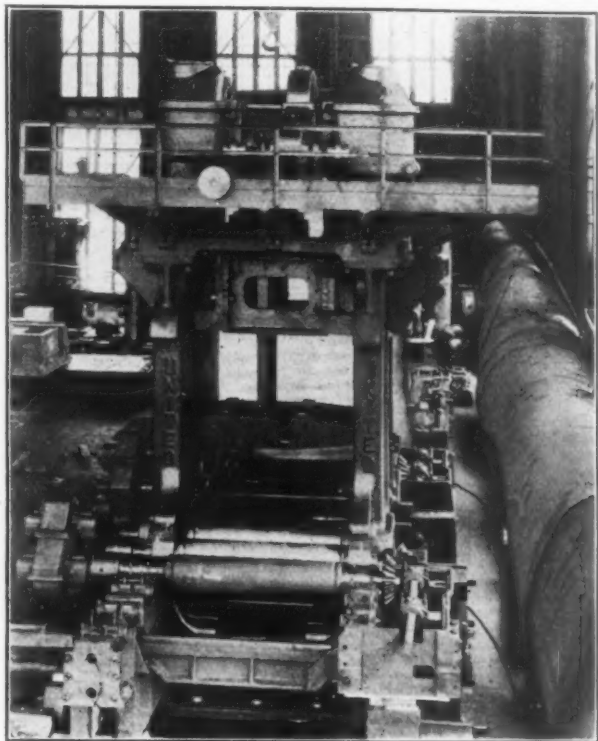
The Motor Is of 10 Hp. and the Wheels from 20 to 30 In. in Diameter and Up to 4 In. Thick. Ball bearings are used throughout. Convenience of assembly and disassembly is a feature

which may be 20 to 30 in. in diameter and up to 4 in. thick. The motor can be furnished for operation on either 220 or 440-volt alternating current, and either industrial push button control or compensator may be provided. The main shaft is 3¼ in. in diameter and the wheel ends 2½ in. in diameter. S.K.F. ball bearings are used throughout. The driving shaft and motor housings are practically free from holes and projections that catch dirt, a feature stressed as making the machine easy to keep clean. The grinder can be entirely disassembled and assembled again in less than two hours, there being only eight bolts to loosen to remove the wheels, shafts and bearings.

Blooming Mill for Homestead Works of Carnegie Steel Co.

Many improvements in blooming mill practice have been incorporated in the 44-in. 2-high reversing unit illustrated, which was built recently for the Homestead works of the Carnegie Steel Co. by the United Engineering & Foundry Co., Pittsburgh, at its Youngstown plant. This mill takes an ingot of a weight up to 25,000 lb. and rolls billets as small as 4 in. by 4 in., slabs 3 in. by 40 in., and blanks for 15-in., 18-in., 20-in., and 24-in. beams.

The mill is of massive construction throughout and with the exception of a few minor parts, the castings



Forty-four Inch Two-High Reversing Blooming Mill

are all of steel made in the steel foundry at Vandergrift, Pa. The approximate total weight of the mill is 1,600,000 lb., the mill housings alone weighing approximately 170,000 lb. each.

The screw-down is of the spur and bevel gear type driven by two 150-hp. Westinghouse motors connected in series. An interesting and important feature of the screw-down, for which a patent is pending, is the method of adjusting the rolls. This method consists of dropping one of the bevel gears out of mesh, which can be done by one man in a few minutes from the platform, thereby permitting the lining up to be done with the opposite screw.

Two solid forged steel rollers on each side of the mill act as feed rollers, those nearest the rolls being carried in a bore in the housing and the others carried in bearings on the face of the housing. These rollers are driven by a train of gears carried in a separate housing on the shoe plate, which in turn is driven from the last roller in the mill table. A 17-in. diameter hydraulic cylinder is used to balance the top roll. All spindles are of forged steel with machine cut teeth.

Motor of 9000 Hp. for McKinney Steel Co.

A 9000-hp. motor, the largest motor ever built for steel mill work, will be installed at the plant of the McKinney Steel Co., Cleveland, to drive the company's new 21-in. continuous billet mill and 18-in. continuous sheet bar and billet mill. The order for the motor has been placed with the General Electric Co. This will be a 6600-volt, three-phase 25-cycle motor and will run at the speed of 107 r.p.m. It will have automatic starting and compensator arranged for plugging and

reversing and will be provided with its own generator set exciter.

The new mills to be installed in the semi-finishing department of the McKinney Co. are duplicates of present mills, the additional units being required to supply steel for the new finishing mill department, which will be equipped with a 10-in. and 12-in. bar mill.

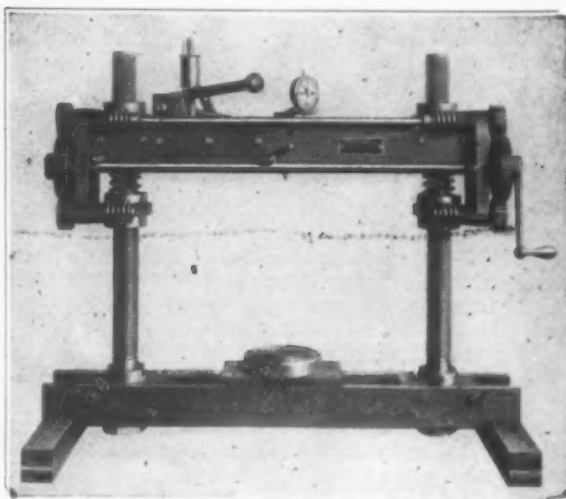
Hardness Tester Arranged for Large Pieces

A Rockwell hardness tester arranged for testing automobile cylinder block and other large castings, and also for testing circular saws which are too heavy and of too large an area to be elevated to meet the penetrator, has been placed on the market by the Wilson-Maeulen Co., 383 Concord Avenue, New York. In the smaller models of the Rockwell tester, the work being tested is elevated into contact with the penetrator but in the new machine provision is made for lowering the testing head, bringing the penetrator to the work.

The arrangement of the machine, which is designated as the universal type, model DU, may be noted from the accompanying illustration. The threaded columns and testing bridge are standard as shown, but the length of the columns and the distance between them may be made to suit special requirements. In the machine illustrated, the base into which the columns are set is the company's shop tool for testing the accuracy of the universal machines, the several companies using the machine having made their own bases. As the machines have been used principally for testing the hardness of cylinder blocks, the bases made by the users to fit into their production train.

By turning the crank handle the whole testing head is raised and lowered and both the principle and accuracy of test are the same as in the smaller sizes of the Rockwell tester. The readings on the large and small machines are alike.

The testing head is lowered with pressure against the work to be tested instead of elevating the work against the test point, for application of the "minor"



Rockwell Hardness Tester Arranged for Lowering Testing Head, Bringing Penetrator into Contact with the Work

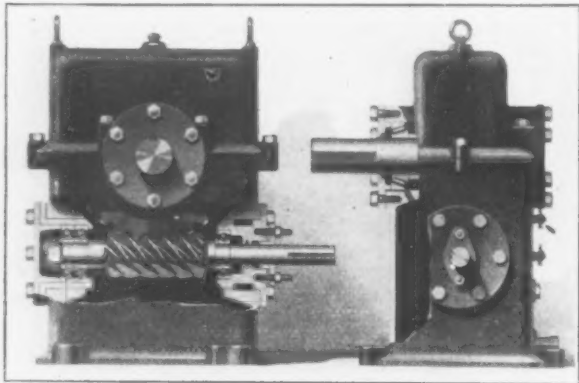
load. Helical springs between the nuts on the threaded columns press the testing bridge upward against the lower surfaces of the threads of the columns. Ball bearings are used at points of greatest friction. The standard machine has horizontal working clearance between the columns of 25 in. or less, and a vertical effective gap of 20 in.

One hundred points of hardness on the Rockwell scale is equivalent to a total depth of penetration of only 0.008 in., two points difference in hardness meaning difference of depth of impression of only 0.00016 in. The large machines are characterized by the makers as large micrometers of high accuracy, and it is claimed the testing head must elevate and lower without measurable back-lash or lost motion.

Worm Gear Reduction Unit for Direct Connection to Driven Machine

The Cleveland Worm & Gear Co., Cleveland, is placing on the market a series of standard worm gear reduction units adapted for direct-connected loads. The new units, designated as the type AT, incorporate features of the company's type AH units previously developed to accommodate overhung loads.

The housing is of cast iron and of square design, which is said to have the advantages of ample oil capacity and a large surface area, the latter assisting in the cooling of the units when transmitting continuous heavy loads. The outside of the housing, being smooth



Tapered Roller Bearings for the Gear Shaft Mounting Are a Feature. The same units may be had with the worm mounted above the gear

and without projecting ribs, is easily kept clean. Petcocks for determining the oil level, lifting rings for the upper section and tapped and plugged holes for the attachment of water cooling coils are provided.

An outstanding feature of these units is the use of tapered roller bearings for the gear shaft mounting, which is stressed as providing unusual capacity to absorb the impact and shocks of heavy continuous service. The method of mounting the gear shaft bearings is shown at the right in the illustration. The gearing is of the automotive type. The worm is machined from a solid nickel-steel forging. After the threads have been milled, the piece is carbonized and case hardened and the forging is then given a heat treatment to refine and toughen the core. The threads and bearing seats are then accurately ground and polished. The resulting worm is said to be a precision screw that meshes exactly with its gear and is strong enough to stand unusually heavy service. The gear consists of a phosphorized bronze rim, shrunk and keyed on a cast iron center. It is chill cast. The gear teeth are hobbled from the solid bronze casting.

The worm is mounted in heavy ball bearings as shown in the left in the illustration. The bearing at the inner end is of the combined radial and thrust type, capable of taking thrust in both directions, and the worm may be rotated in either direction to suit the requirements of the installation. The bearing at the outer end of the worm shaft is of the straight radial type, arranged to float in the casing and accommodate the lineal expansion of the worm. All bearings and the gear contact are lubricated by splash from the oil reservoir in the bottom of the housing.

It will be noted that the worm in the standard type AT unit is located below the gear. These drives can also be furnished with the worm above the gear, if desired, in which case the unit is designated type RT.

Heavy Gasoline Locomotive

A 20-ton gasoline locomotive added recently to the line of the Vulcan Iron Works, Wilkes-Barre, Pa., and primarily adapted for use on standard gage track, in shifting railroad cars, is here illustrated.

The new machine, designated as the model HS-20, is similar to other heavy models offered by the company. Steam locomotive practice is followed in the

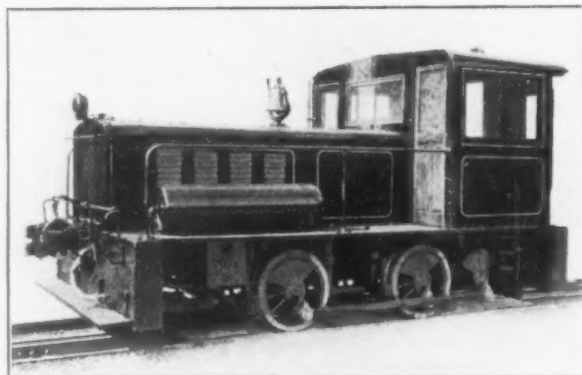
chassis construction, the frames being of cast steel, open bar type, which is said to provide for long life and accessibility to all underneath parts. Springs are of elliptic type with a cross equalizing arrangement giving three-point suspension. The locomotive is equipped with M. C. B. automatic couplers with spring buffer and draft rigging arrangement in the bumpers, which is said to take up the shocks of coupling and relieve the strains in pulling and pushing heavy cars. The locomotive is mounted on four steel-tired driving wheels.

A six-cylinder 125 hp. gasoline motor of industrial type is used. The crankshafts are of drop forged chrome-nickel steel, heat treated, accurately machined and balanced to permit the engine to run at moderately high speed without undue vibration. A built-in gear-driven governor is provided, and lubrication of main, connecting-rod and cam-shaft bearings is by means of a forced feed system. Proper oil pressure is maintained by a spring loaded pressure relief valve.

The ignition system is of the dual type from a high tension magneto with impulse coupling and a battery distributor coil. Spark control of the two instruments is synchronized by a linkage mounted on the magneto bracket and connected by a rod to the spark control lever. Two spark plugs per cylinder are used, the magneto being connected to the plug over the intake and the battery distributor to that over the exhaust valve. An electric starter is provided. The clutch is of oversized multiple disk type running in oil.

Constant mesh gears instead of the sliding type are used in the transmission, and speed changes are made by means of jaw clutches. Gears, clutches and shafts are chrome nickel steel forgings, heat treated and hardened. The final drive is by means of driving and parallel rods from cranks on the jack shaft to the crank pins in the driving wheels, traction being provided on all wheels.

The air equipment is of the straight air and automatic brake type, complete with air compressor distributor valve, reservoirs and accessories. The com-



Twenty-Ton Gasoline Locomotive Adapted for Use on Standard Gage Track

pressor is driven from a take-off on the transmission and is provided with an automatic governor.

The locomotive is designed for four speeds forward and reverse, and is geared from 2 to 15 mi. per hr. The maximum draw bar pull is 12,000 lb.

Friction Clutch and Cut-off Coupling

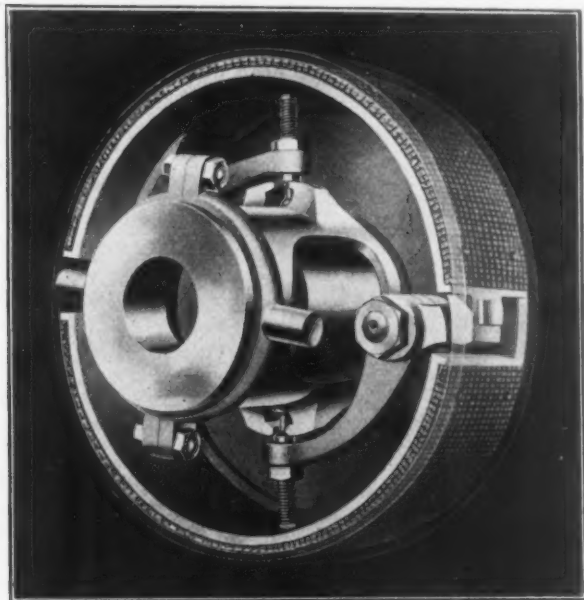
Simplicity of construction, compactness and positive action are features claimed for the friction clutch illustrated, which is known as the Hoerl and has been placed on the market by the Wolf Co., Chambersburg, Pa. It is made as a coupling or with a sleeve for pulley.

There are only eight parts, two rings, two levers, a shell and a cone. The clutch is engaged by the cone sliding along the shaft, causing the levers to force the Raybestos covered rings against the inside of the shell rim. It is claimed that the clutch can be thrown in gradually or quickly, the release being positive as soon as the lever is thrown. All parts of the clutch may be

made accessible by removing a set collar. When throwing out the clutch the action of the levers and cone pulls the rings away from the shell assuring, it is claimed, positive release regardless of the speed.

The entire friction surface being as far removed as possible from the center of the shaft, maximum power per square inch of contact is said to be developed. It is stated that if proper adjustment is maintained there is no slippage after engagement.

Quiet operation is a feature and the absence of projecting parts is stressed as protection from accidents. Larger friction surface than necessary to develop the rated horsepower is provided, this being said to add to the life of the device and make frequent ad-



Hoerl Friction Clutch

justment unnecessary. Necessary adjustments are made by a slight turn of two screws. Several sizes, from 4 to 700 hp. at 100 r.p.m., are available.

Welding of Boiler Plate in 1865

Under the heading "Sixty Years Ago" the *Engineer*, London, publishes each week brief excerpts from its issues of sixty years ago. In a recent paragraph relating to the issue of May 19, 1865, it was pointed out that a well-known engineer held that the general structure of boilers, as made at that time, was "radically vicious" and that it would continue so so long as the principle of riveting remained in use. He held it clearly established that the metal of a boiler should be of uniform thickness, at least where in contact with the fire. He considered it impossible to secure this uniform thickness in the heating surfaces "until we get rid of the folded surfaces essential to riveting."

To effect this change, he suggested that all boiler seams should be welded. The oxyacetylene or other blow-pipe and the use of electrical methods for welding were unknown in those days. Consequently Mr. Adams described in some detail his proposed method of welding the seams, an undertaking which must have seemed to many engineers of his time a difficult or impossible procedure. His plan was to clean the scale from the two edges to be welded, then to place them in close proximity and to surround them with a box of fire-clay fitting close to all the parts, except those to be united. Entrances and exits were to be formed in the box after the manner of gates used by foundrymen. Carbureted hydrogen gas and air were to be forced under pressure through the box and ignited in its interior. When the surfaces to be united had become "pasty or partially melted," hydraulic or other pressure was to be brought to bear, forcing them together and uniting them in a homogeneous manner. He argued that, as no free oxygen would be present inside the box, no scale would form at the welded surfaces.

Electric Hot-Plate Used for Lowering Temper of Forging Tools

At the plant of the Buffalo Bolt Co., North Tonawanda, N. Y., many tools and dies are made which must be specially heat treated in order to obtain maximum output on automatic and semi-automatic machines. In the case of open header dies and solid cold-forging tools, it is essential that the body of the tool be of unusual hardness, and at the same time that the working ends themselves have less of the characteristic of hardness and more that of toughness. For lowering the temper of the ends of these dies and cold forging tools, the electric hot-plate here illustrated is employed.

The dies and tools are first heated to a temperature of 1450 to 1500 deg. Fahr. in an electric furnace and then quenched in a saline solution. After cooling they are again heated, in an electrically heated oil-tempering bath to a temperature of approximately 450 deg. Fahr. They are then allowed to cool to normal air temperature. Ordinarily, this cycle would constitute the complete heat treating process.

The tools and dies in question, however, are subject to great strains and shocks, especially the carriage bolt open header dies, the square neck opening of which with its sharp corners constitutes a weak working part and, unless sufficient toughness is imparted to the metal at this point, the life of the die will be short. In order to provide the requisite toughness at the point where it is needed, without destroying the hardness in the body of the dies and tools, the ends are tempered by means of the electric hot-plate. The dimensions of the plate are approximately 9 by 18 in., and the electric heating element, suitably insulated, is cast in the plate itself, which rests on an electrically welded frame about 2 ft. in height.

After cooling from the oil tempering treatment, the working ends of the dies and tools are polished with emery cloth, placed on the heated plate and left until the ends are of bluish color, indicating that the draw-



The Hot-Plate Is Employed In Making the Ends of Dies and Tools Tougher

back operation has been completed. They are then removed and permitted to cool in the open air. This operation, which is said to be quickly performed, has been found to increase materially the life of the dies and tools. The plate, oil tempering bath and electric furnace employed are of General Electric Co. manufacture.

Buys the Minster Machine Co.

On June 30 the National Automatic Tool Co., Richmond, Ind., purchased the patent, manufacturing and sales rights of the Minster hi-duty drilling machines from the Minster Machine Co., Minster, Ohio. The manufacture and sale of these machines will in the future be carried on at the plant of the National company at Richmond.

NEW OPEN SIDE PLANER

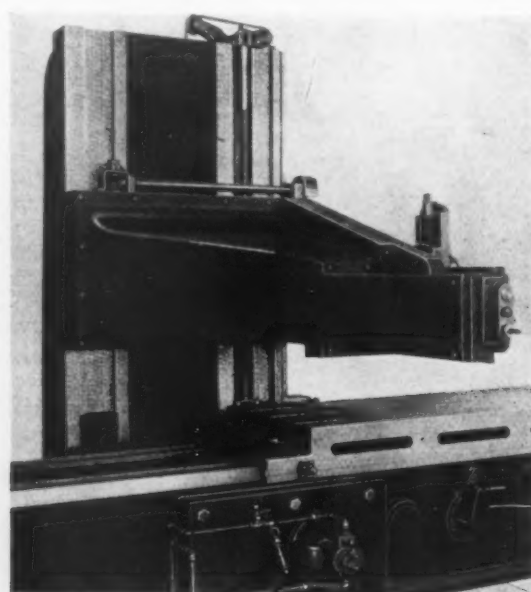
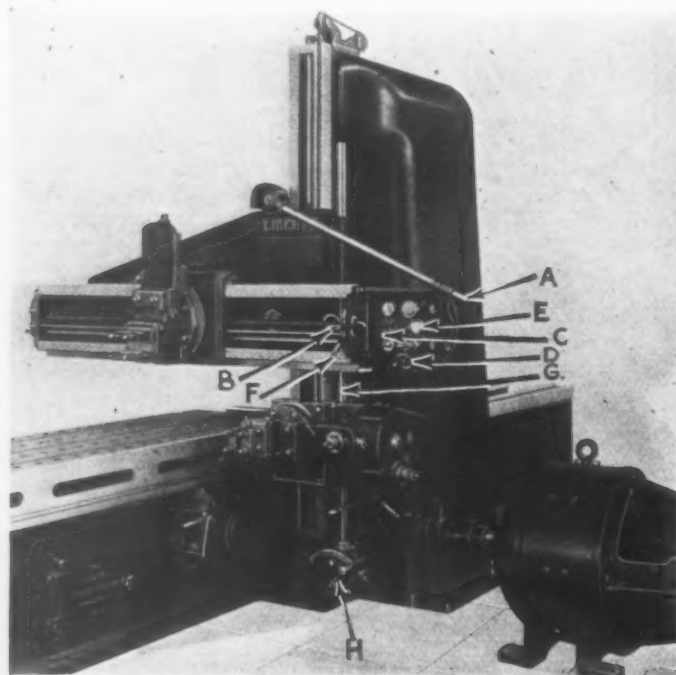
Rigidity Comparable to That of Double-Housing Machine Claimed—Control Centralized

High degree of rigidity in the cross rail support is stressed by the designers of the open-side planer illustrated, this feature being of particular importance to those who might conveniently employ a planer of the open-side type but who are deterred by the feeling that with the cross rail supported only at one end the required rigidity is not present. It is claimed by the maker of the machine, the Liberty Machine Tool Co., Hamilton, Ohio, that under test on cast iron, with a cut $1\frac{1}{2}$ in. deep and a feed of $\frac{1}{4}$ in., the maximum deflection at the outer end of the rail was found to be only 0.0035 in. This is pointed to as being comparable to the rigidity of the usual form of double-housing machine.

This rigidity is claimed to be obtained by providing an unusually massive knee on which the cross rail is mounted. The arrangement of the knee may be noted

the rate of feed for which the setting has been made. A $1\frac{1}{2}$ -hp. motor is used for these movements, the motor receiving current through a protected trolley that contacts with conducting strips fastened to the housing. Either alternating or direct current can be used and if necessary, it may be taken from a lamp socket. The screws which move the head on the cross rail and the side head on the housing are held stationary and in tension, movement of the heads being accomplished by the rotation of a nut on the screw. Lever *F* provides for controlling the horizontal feed of the head on the rail or the vertical feed of the tool slide. The vertical movement of the tool slide is also accomplished by revolving a nut around a stationary screw held in tension, and the screw for elevating and lowering the cross rail is held stationary and in tension. Vertical shaft *G* is employed for transmitting power to the feed mechanism of both the rail head and side head. The transmission gears are arranged so that throwing lever *H* into two different positions enables the feed to be accomplished either at the end of one cut or just before starting a new cut.

The mechanism at the end of the cross rail, and for



The Massive Knee on Which the Cross Rail Is Mounted Is a Feature. Rail and side head motors are separate

from the accompanying rear-view illustration. Locking of the knee in any desired position is accomplished by a hand crank on shaft *A* which transmits motion through two pairs of bevel gears to a vertical screw connected with a taper gib. Turning of the hand wheel pulls this gib up and provides liberal locking power through the combined multiplying action of the screw and the wedge.

The present open-side planer incorporates all of the outstanding advantages of the company's new double-housing machine, which was described in *THE IRON AGE* of Dec. 25, 1924. As in the double-housing planer, one motor is employed for driving the table, and independent motors are furnished for the rail and the side head. This arrangement is intended to eliminate overhead works and make the cross rail and the side head fully independent units, capable of employing any feed or rapid traverse movement. Elevating or lowering the cross rail and also the power rapid traverse of the rail head vertically and horizontally, are accomplished through the lever *B*. With this arrangement it is impossible to engage two different movements simultaneously, thus furnishing a fool proof control for the rail. Feeding of the head vertically and horizontally is controlled by lever *C* and the desired rate of feed is secured by turning the small hand wheel *D* which is connected with the dial *E* that shows

controlling the feed and power rapid traverse of the side head, and also the feed reversing mechanism at the bottom of the housing, run in oil. The housing extends down to the floor and it is attached to the bed by means of bolts, fitted into reamed holes. Additional heavy dowel pins are used, eliminating any movement between the housing and the bed. The latter is of the double wall type, ribbed both lengthwise and crosswise and webbed at the top. Provision is made for forced feed lubrication, the pump and control valve of this system being located on the outside of the housing. A sight feed attachment permits the operator to see whether the system is functioning properly.

To Show Equipment at Welding Convention

It has been decided to hold the fall meeting of the American Welding Society on Oct. 21, 22 and 23 at the Massachusetts Institute of Technology, Cambridge, Mass. An exposition of welding equipment, accessories and of welding work will be a feature, the number of exhibitors for whom space is available being in the neighborhood of 65. R. L. Browne, 141 Milk Street, Boston, is chairman of the program committee.

ENGLISH MILLS DULL

Sheet Bar Mills Competing with Cheap German Bars

The iron and steel industry in England is in very bad condition, due to the fact that mills in France, Belgium and Germany are able to undersell English mills, according to Charles R. Hook, vice-president and general manager of the American Rolling Mill Co., and president of the Armco International Corporation, Middletown, Ohio, who has just returned from a business trip abroad.

"Companies in Germany, Belgium and France are producing semi-finished products at an extremely low price, because they can secure cheap labor. The daily wage of iron and steel workers in the last-named country, based on the hourly rate plus the bonus, is only 40 fr., which is equivalent now to less than \$2. Common labor is available for French mills at 16 to 18 fr. a day. German and Belgian wages are lower still.

"Because of this unusual labor advantage, the European producers have successfully invaded foreign markets formerly belonging to England. However, the sheet and tin mills of England are running practically at capacity. These mills can purchase bars from Germany and other countries and can, therefore, turn out finished material at a low price. It is a common sight to see sheet bar mills in England closed down while bars from Luxemburg and other continental points are being unloaded at the British plants.

"There is no unemployment in France. In fact, a shortage of labor exists in some plants. Operations are

limited only by the ability of the company executives to obtain sufficient workmen.

"American influence is an important factor in the iron and steel industry abroad. I saw blast furnaces being reconstructed in France and England under the supervision of American engineers. Mills in France designed by American engineers were also just getting under way. Two new sheet mill plants started up in the last 18 months are laid out along American lines with furnaces, etc., designed by United States engineers.

"On the ordinary product American steel plants cannot hope to compete against European companies for business in European markets. However, certain American concerns have succeeded in establishing a foreign market on high grade products, the standard of which has not yet been attained by Europeans. Business men in France and other countries plan to copy American products and methods and then get their operating costs down so low that we cannot meet their prices. For instance, the French realize that they have been backward in producing quality sheet steel, but they are determined to improve their practice. When their quality is equal to ours, they express the intention of selling over here, hoping to get a foothold in our domestic market.

"Just as an illustration of the terrific competition to which the English iron and steel interests are subjected, the case can be cited of an English representative of the English company returning home from India, who stated that in his particular branch of the industry Germany and Belgium had taken 85 per cent of the business in India that formerly went to English mills. Germany is going aggressively after business in both Italy and Turkey, and is meeting with much success."

BILLION FARM EQUIPMENT

What Purchases This Year Should Amount to if Crops Are Good

"With but few exceptions," says John A. Topping, chairman of the board Republic Iron & Steel Co., in an article in the *July Magazine of Wall Street*, "the iron and steel trades have never prospered without agricultural prosperity.

"At present, the outlook for the farmer is bright and his purchases of machinery and steel promise to exceed by far the record of the last three years. In this period, due to adverse agricultural conditions, they were compelled to economize; consequently, the farmers' wants have been accumulating and are somewhat mandatory, with purchasing power much improved. Re-

cent estimates of the agricultural department suggest that for machinery alone, during the next decade, the farmers' requirements will amount to from \$8,000,000,000 to \$10,000,000,000, and for the year 1925 about \$1,000,000,000.

"As to the railroads, their wants for 1925, it is estimated, will be close to last year's total expenditures for improvements and equipment, which amounted to \$874,743,000, the American Railway Association estimating railroad equipment and improvement requirements for the year 1925 at \$750,000,000.

"In general, as measured by all trade indices, the volume of business is satisfactory, labor is well employed, the purchasing power of our people never greater, and there is, therefore, every reason for optimism. In fact, I am confident the year 1925 will show a substantial increase over 1924 in the production of iron and steel, if present crop prospects are realized."

Foundrymen Organize Campaign for New Members

The American Foundrymen's Association has organized a nation-wide committee to extend its membership. An extensive campaign is to be conducted with Vice-President A. B. Root, Jr., as general chairman of the committee. State and district chairmen have been named in nearly every State in the Union, as well as in Canada, and some satisfactory results are expected during the coming year.

Budgeting to Be Discussed

Budgeting will be the topic for discussion on one of the two days of the general convention of the American Management Association, which will be held at the Hotel Astor, New York, Oct. 15 and 16. A paper on "The Principles and Scope of Budgeting," to be presented at the morning session, will be followed by group meetings to discuss budgeting of financial requirements, of office expenses, of sales expense and of sales quotas. The basis of the discussion will be the budgeting procedures of representative companies.

The other day of the convention will be devoted to principles of Management Organization, the discus-

sion centering on the preliminary research of the association into "Some Trends of Management Organization." Organizing and delegating financial and office management functions, principles of organization for production, and methods of organizing the marketing function will be among the topics taken up at group meetings. It is planned to make "Forecasting and Stabilizing Business" the topic of a luncheon meeting, to be held Oct. 16.

The line of fire-pump controllers made by the Cutler-Hammer Mfg. Co., Milwaukee, has been redesigned to meet the latest requirements of the National Board of Fire Underwriters. The controllers include both manually and automatically-operated types for direct and alternating-current service as well as types arranged for combined manual and automatic control.

The July meeting of the New England Foundrymen's Association will be held in Worcester, July 15. The Norton Co. of that city has extended an invitation to the members to make an inspection of its plant. The August meeting, as usual, will be the annual outing, the association to be the guest of the Providence members.

Labor's Earnings Gain; Efficiency Drops

But Spread So Far This Year Between Value of Product and Cost of Labor in Iron and Steel Industry Is Larger Than Last Year

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY SCHOOL OF BUSINESS RESEARCH

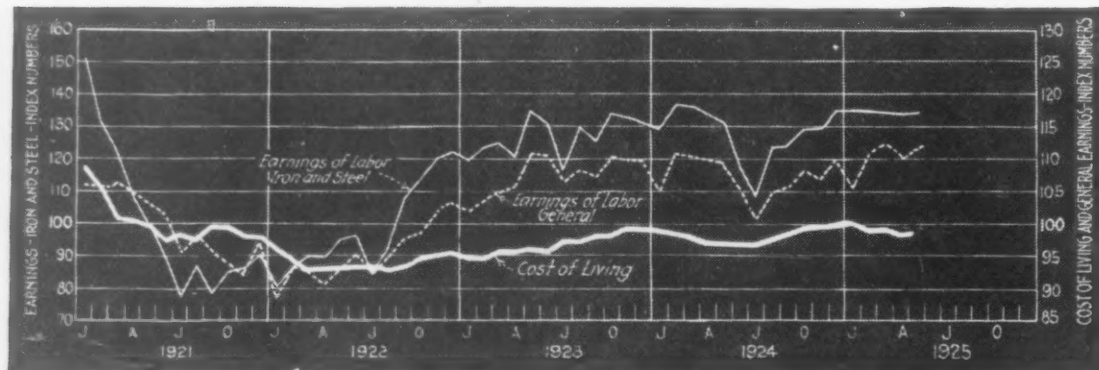


Fig. 1—Earnings of Labor in the Iron and Steel Industry Have Not Only Been Higher Than Earnings of General Labor But Have Also Been Much More Stable During the Last Six Months

EMPLOYMENT of labor in manufacturing industries, as reported by Federal and State agencies, showed a small decline in May. The decline appears to have been somewhat greater than reports indicate, when allowance is made for seasonal influences.

Manufacturers' payrolls increased slightly, as is usual at this time of the year.

Per capita earnings increased more definitely than did the total payrolls. This may be explained by the fact that there is a tendency to hold the skilled workers when operations are being curtailed and to drop the less highly paid, unskilled laborers first.

The iron and steel industry tends to show the same increases and decreases in payrolls and employment as manufacturing industries in general, but the swings in the iron and steel industry are somewhat wider and the turning points are more sharply defined.

Reports from individual States confirm the curtailment of labor forces in the iron and steel industry. In Illinois, for example, where the general labor situation in May was the worst in four years, steel mills laid off nearly 4 per cent of their workers. Some railroad car and locomotive shops were working four or five days a week, while others were cutting their payrolls.

New York State reported heavy reduction in forces in steel and railroad equipment industries. Small reductions were also made in foundry and machine shops. Steel mills, however, were ahead of their schedules of a year ago.

Steel Labor Earnings High

THE cost of living increased slightly in May. The index is now back to the same level that it occupied in both February and March (Fig. 1).

The average earnings of factory labor in general also increased in May, rising from 110 per cent of the 1921 average of 111.7. With the exception of the March peak (when the index was 112), the average earnings of labor are at the highest level for the period covered.

In the iron and steel industry the increase in average per capita earnings was from 133.2 to 133.7.

The conclusions to be drawn from Fig. 1 are as follows:

(1) Earnings of labor in the iron and steel industry have been more stable in the past six months than in any period of similar length during the years since 1920.

(2) On a 1921 base, earnings in this industry are relatively higher than earnings of factory labor in general.

(3) Earnings of labor in general, and of iron and steel labor in particular, continue high in relation to the cost of living, showing little change in this respect during the last four months.

Wages Take Larger Share of Value

THE downward trend in the estimated total value of iron and steel produced and in iron and steel payrolls continued in May (see Fig. 2). The decrease was more moderate, however, than in either the preceding month or in May, 1924; hence the estimated value of the product, as well as the payrolls, holds at a higher level than it did a year ago.

As forecast in this section last month, the margin between the value of iron and steel produced and labor cost showed a decrease in May. As production has declined further, while prices are still weak, the decrease will almost certainly be continued in June.

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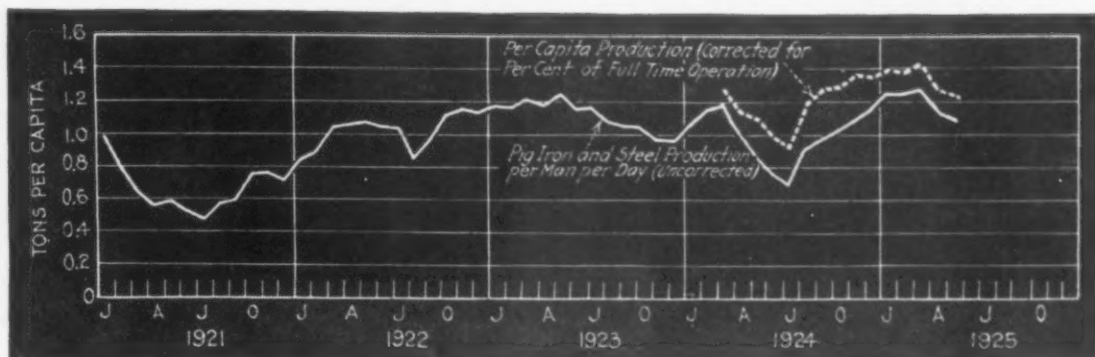


Fig. 3—Output per Man in the Iron and Steel Industry at Lowest Point Since Last October

While no definite upturn in the earnings of the iron and steel industry is yet in sight, it can be said that the spread between values produced and payroll expense has been appreciably greater during the first five months of 1925 than in the same period of 1924.

Output Per Man Continues to Decrease

THE production of iron and steel per man per day decreased further in May, but the decrease was more moderate than it was in April. When correction is made for percentage of full time operation—thus putting production on an approximate man-hour basis (Fig. 3)—the decrease proves to be still more moderate.

While the output per man in May held at a higher level than it did a year ago, it was lower than in any month since last October. On a man-

hour basis, the output was less than in any month since August.

On either basis shown in Fig. 3, however, the output is well above that of May, 1924.

Summary

1. The cost of living increased slightly in May, returning to the February-March level.
2. The per capita earnings of labor also increased, and continue high in comparison with living cost.
3. Employment decreased, but not so rapidly as a year ago.
4. The estimated output of iron and steel per man hour, while decreasing in May, was greater than last year, and in the first five months of the year the value of iron and steel produced was greater in comparison with payrolls than in the same period of 1924.

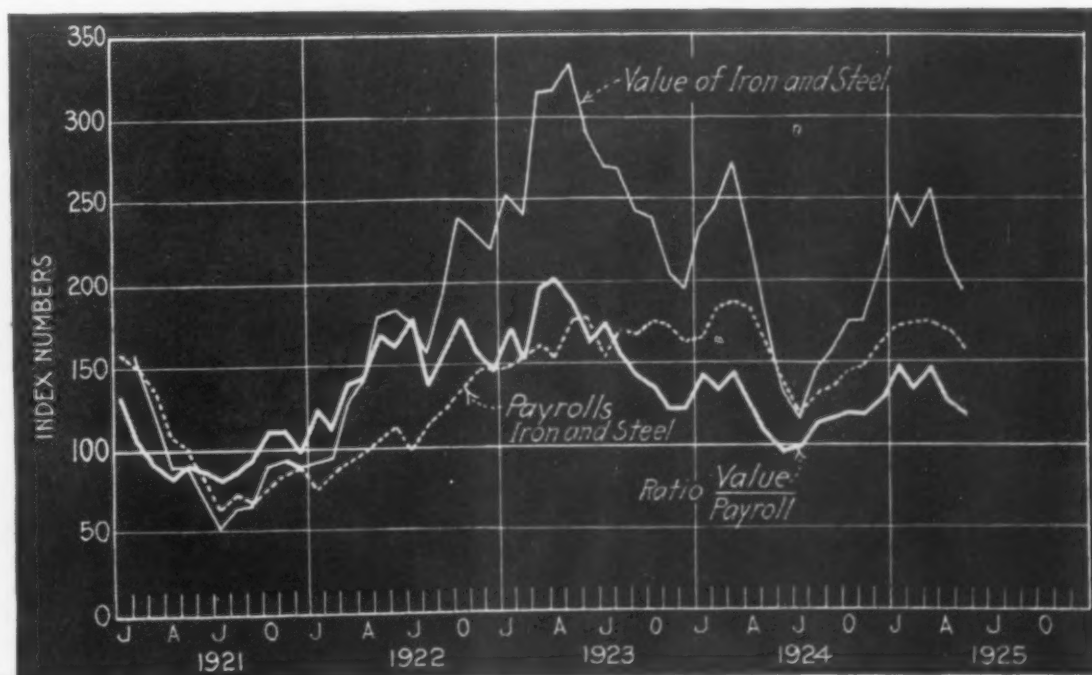


Fig. 2—The Margin between the Value of Iron and Steel Produced and the Cost of Labor Decreased in May. A Decrease Will Probably Be Evidenced in the June Figures Also

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The Stock Market

AS underpinning to the bull market in securities we have the interest rate for money relatively low and the yield of many good stocks and sound bonds relatively high. Consequently investors do better by buying stocks and bonds than by lending their money for interest, and they can do even better by borrowing some money from those whose business it is to lend. Sooner or later these conditions will come into equilibrium and then the bull market will come to an end.

In any such market, whatever be its inspiration, there is always a purely speculative participation by persons who have no idea of buying for investment, but who in their quick discernment of conditions are anticipatory and buy simply with a view to selling soon to others. This is perfectly legitimate. Not so, however, is that speculation of the crowd, which without any intelligence or discrimination buys purely for a gambling turn and is often inveigled into doing so, only to be hooked. There have been such phases in the bull market of 1925, but they have passed, and the present phase is largely that of investment buying.

That the present phase is of that character is well evinced by the description of the market as a selective one. That is to say, it is not one in which all stocks are bought indiscriminately, but on the contrary only those whose prospects are good. The commission houses have not yet learned this fully and we still hear idle talk to the effect that as the rails and industrials have had their rises the turn of the neglected coppers must come next. The turn of the coppers as a group is never going to come, but the good ones among them are being bought now, like the good ones among other groups.

Thus it is all around. No matter how grave be various fundamental evils, such as the attitude of labor, the theory of taxation as a corrective of social inequality, and some other things, no one should be blind to the facts that there may be a

high degree of industrial activity at the same time and that the country's population is ever growing.

Consequently the business and earnings of the public utilities are increasing, and by decisions of the courts their earnings are being protected from confiscation. Similarly is railroad traffic growing, and by virtue of economies in operation many of the railroads are doing well. Many of the manufacturing companies have come into a better position than since 1919-20. The petroleum industry at least has become stabilized and profitable. A good many of the mining and metallurgical companies, which furnish raw material to all the others, are prosperous. We have an administration in Washington that wants to be helpful to business, which it views as beneficial rather than criminal.

With all that has been said of unsatisfactory features of current business, it is the preponderance of favorable factors which finds reflection in the bull stock market. There will be readjustments from time to time, and at some day everything will be overdone, but with money at 4½ per cent and dividend yields at 6½ per cent that day apparently is not imminent.

An Anthracite Strike?

WHEN the New Haven railroad recently announced an increase in some commutation rates immediately there was an uproar in a line of suburban towns. Without any doubt the increase was an injustice to thousands of people, who aimed their indignation at the railroad company without thinking that its stockholders had been deprived of dividends for many years and that the bloodsucker was organized labor.

The anthracite coal miners and operators are now in a controversy which presently may develop into a strike, a suspension of operations and public inconvenience. The anthracite miners

have the firmest of all unions, which, moreover, is protected from competition by legislative restrictions. Thus results the grotesque situation of the anthracite miners demanding all that they want, with excellent chance of getting it and the public to pay the bill, while there are many bituminous coal miners idle and anxious to work for reasonable wages. Notwithstanding this, there is more or less sympathy for the anthracite miners among the very people whom they propose to soak.

The anthracite miners are protected by other restrictions, such as municipal ordinances, especially in New York, prohibiting the general use of bituminous coal. Let these be lifted and there would be more work for bituminous miners and less for the anthracite, who would then become more reasonable. This would hit the anthracite operators, too, and so ought to please persons who regard them as monopolistic and reprehensible in various ways.

If there come an anthracite strike no doubt we shall feel the political hand. We may expect references to the late United States Coal Commission, spineless and stupid though it were, in spite of the high ability of individual members. No doubt there will be talk of nationalizing the mines. All of which will be in disregard of the glaring facts that a monopolistic labor union has us by the throat and that we preserve legislative restrictions to aid the strangle-hold upon ourselves.

What Price Orders?

HERE and there the view is expressed that business is poor. Nothing more than the figures covering production and distribution of goods for the first half of the year is needed to correct this notion. But there is no doubt that if business volume is better than average, business profits leave something to be desired. There have been many plausible explanations for the poor profits of the past six months. "Overcapacity," says one analyst; "Reaction from excess production," another. The truth is that it is human nature to blame general and intangible influences over which we have no control for our ills and worries, when usually the trouble lies much nearer home.

The general manager of a Michigan tool company writes to THE IRON AGE recognizing this fact:

The trouble is that the majority of small manufacturing plants do not know how to estimate costs properly. They do get the business, but it is the kind of business which ultimately breaks them. I cannot see why some standard formula cannot be adopted by practically all plants for estimating purposes. . . . Today the favorite indoor sport is as follows: You quote on lots of 500, 1000, 2500 and 5000 pieces. Your 5000 piece price is the lowest, of course. You receive an order from the customer for 2500 pieces at the 5000 quantity price. You either do the work or return the order. . . . Another favorite: The bill is due for 2 per cent discount on the 12th

of the month. You receive the check on the 25th with the discount deducted. It may be smooth and smart, but to what is it going to lead?

Well, among other things, it ought to lead to a stiffening of the sales backbone, to a recognition of the fact that orders are not profits and that if money is lost at a certain price, the less business taken at that price, the better.

It ought to lead to the end of the present scramble for business at "any price" so long as the order is secured.

It ought to lead to a definite stand against the petty pilfering of discounts and deliberate small lot ordering at prices quoted for larger quantities.

But it never will lead to these things until sales managers and salesmen recognize that orders are not profits. Alvin E. Dodd of the Chamber of Commerce of the United States recently declared that many orders and many customers that are now supposed to represent desirable business are actually losing propositions for the seller. He told of a large wholesale establishment which decided to adopt a customer rating, not on the basis of credit, but on their value as customers. As a result of this study he deliberately refused to solicit business from about half the former number of accounts. "Unprofitable customers hang on by their teeth; orders are given only to fill immediate needs, and payments are slow, so that the expense of doing business with them acts as a drag upon other business which is profitable when unincumbered."

We do not comment now upon the merits of that tendency toward small and more frequent orders which is called "hand-to-mouth" buying, other than to note that it does avoid any likelihood of excessive losses from inventory depreciation. But there is no question regarding the unprofitable customer. Ratings may sometimes be useful; but if costs are known and prices are made with due regard to profits rather than mere volume of business, the costly customer will be eliminated without more ado.

The Bugaboo of Market Precedents

A COMMON remark in the steel trade lately has been that the business finds itself in much better shape than a year ago. There is a feeling of relief if not of surprise and the inference is that there might have been a slump like last year's.

Why expect a repetition, even in milder form, of what occurred last year? The 1924 slumps in buying from January to May and in production from March to July had scarcely any precedents, and none if we count out the occasions when there were strong reasons from outside, such as the panic of October, 1907. The fact that those slumps were so unusual would be in itself an argument against their repetition, while the fact that the experience was so recent would be a still stronger argument.

Another bugaboo lies in the tradition that July and August are necessarily dull months in steel. This represents loose thinking, like the more vague impression that steel as such is more or

less seasonal. It may be readily admitted that, other things being equal, buyers are less likely to act in July and December, for in those months they have some special interests, vacations in one case and year-end adjustments in the other. But trade currents need not be strong to rise above such influences.

There is a means of checking these more or less popular beliefs as to the times in the year when steel buyers are more active and less active. At the middle of 1910 the Steel Corporation changed its system of reporting its unfilled obligations from quarterly to monthly dates. Since then the monthly increases or decreases in the total have directed special attention to the relation between entries and shipments; and a scrutiny of the records enables one to pick out, for fourteen years past, the high and low periods in each year as well as to observe the trends in the rate of buying.

Such a scrutiny not merely fails to support widespread impressions as to when steel should be active and when not, but shows that trade influences have quite overcome the influence of the calendar. Picking out for each of the fourteen years the high month in buying one finds that December has merely a little advantage over the other months. The four months November, December, January and February took the position ten times among them, or an average of two and one-half for each, when an equable distribution would give each month only one. The high months in other years, each month scoring once, were April, June, September and October. The low months showed no such bunching, January scoring once, February not at all, March twice, April once, May twice, June twice, July once, August not at all, September, October and November each once and December twice.

Thus while November to February shows up strongly as a high period, July almost escaped, and August did escape, being a low month at any time in these fourteen years. This is merely as to high and low spots. As to July trends, in six of the years July showed less buying than June, in seven years more buying and in one year no discernible change.

Whence, then, did such ideas arise? Partly, it may be supposed, from the notion that it looks as if it ought to be that way, and partly from the statistical fact that pig iron production tends to go down in July and August on account of atmospheric conditions, the high humidity cutting the output of the individual stack and thus, moreover, managers have been known to select that time for relining and other repairs.

Getting Rid of Industrial Fatigue

SOMETIMES it is charged that research into industrial fatigue has been seriously neglected, in comparison with the work in other directions that has been done for the welfare of employees. Great Britain is criticising just now the failure of a commission that has been studying the problem, to arrive at definite, constructive conclusions. The same cry is raised once in a while in the United States. Those who are un-

familiar with what has been done of late years to improve conditions in manufacturing plants frequently, it seems, get the idea that the fatigue of workers is something to which many employers are wholly indifferent.

Exactly the contrary is the fact. The effort to make industrial tasks fit the strength of the employee, and in fact to open to men of ordinary physique tasks which formerly required great brute strength, has been given much attention.

The owner knows, if he is the sort of person to be successful, that he cannot afford to let his employees get tired out or become discontented. Therefore, he insists that his shop executives and engineers be constantly alert to discover such cases and find for them a remedy. It may be, for instance, a lifting job, where machine power should replace man power. It may be a fume-polluted or a vitiated atmosphere, which requires the installation of a ventilating system; or it may be inadequate lighting. Whatever the cause, it is removed if it be possible to do so. The alternative usually is production below what it should be, and unnecessarily rapid and expensive labor turnover, both of which the management resents.

A typical instance of changed conditions is found in the modern wire mill. Formerly the wire drawer lifted a coil of wire weighing upward of 200 pounds from the floor to the block, and when the operation was completed lifted it back to the floor. Had it not been recognized that it was a waste of human material to compel men to do such work all day long, week after week, today there would not be enough men of sufficient brawn to man the mills. None but the strongest, heaviest men could survive; the average man could not even make a start.

But observation and study revealed the weakness, and the electric hoist, traveling on an overhead trolley, was substituted. It lifts the coil from the floor to the block, strips the block of the coil and lowers it to the floor, removes it to another machine or the annealing room or elsewhere. Hundreds of similar instances of recognition of industrial fatigue as an element in production could be cited.

The study of the subject is intimately combined with that of accident prevention. In all effort to reduce shop hazards abnormal physical exertion has been discouraged. It has come to be well recognized that the overtired man or woman is more liable to accident than one who is normally fresh. The tendency to carelessness is greater. Then, too, strains, especially those which cause or may develop into permanent abdominal injury, are always costly.

The net result of the effort of recent years has been to put the efficiently managed shop or mill rather beyond the necessity of organized research into industrial fatigue. Doubtless in exceptional cases this statement would not be true, due to the nature of the industry. Probably, too, even in the best managed plants, an intensified campaign would find additional worth-while changes to recommend, as always happens, since "a new broom sweeps clean." But, generally speaking, the bulk of the work of eliminating industrial fatigue has been done.

CORRESPONDENCE

How Pig Iron Warrants Can Serve the Producer in Slack Times

To the Editor: The writer notes with a great deal of interest the comments by Mr. Atkinson and Mr. Samuel in your issues of June 11 and June 25 covering the foundry pig iron situation and its relation to the question of pig iron storage warrants.

Always there has been a misconception in the minds of a great many people as to the proper function of the warrant in the economics of the iron trade. In both England and this country special emphasis at times has been placed upon dealing in warrants on the exchange. Such transactions are incidental to the larger question and should be classified as merely one method of marketing warrants. Whatever there may be of great or small value in this method should have no bearing upon the main point.

As Mr. Samuel very clearly states, "the laws of supply and demand are the only laws that can cover the price of foundry iron," and this is true whether the iron is "free" furnace iron or covered by warrants. The aim of the warrant is not to change the law of supply and demand but to offer a means whereby at any given time the extremes of supply and demand may be softened. The intelligent growth during the last 25 years of constructive business principles has emphasized the disadvantages to both producer and consumer of extreme fluctuations in the production and price of commodities. Rapid fluctuations are helpful to no one and frequently result in losses by either the producer or consumer, such losses really being beyond their direct control. If these losses can be lessened in any way there accrues an economic gain to all parties.

It has always been the contention of the warrant company that its primary function was that of furnishing a legitimate means of temporarily taking care of excess supplies, and thus avoiding throwing on the market "distress" tonnages, which, though small in volume in proportion to current consumption, were nevertheless sufficient to affect materially the fair market price of pig iron.

Assists Conversion of Raw Materials

It is sound business judgment, as one enters a period of depression, to convert all raw materials into a form of finished material that can be readily marketed if occasion requires. The segregation of such finished material into an asset in the form of warrants, which can be readily marketed in small units if necessary, is the ideal way of safeguarding one's financial position. In case of necessity the amount of money borrowed against pig iron, grouped as a separate and distinct asset from all other assets, is greater in proportion than the amount that can be borrowed when the tonnage of pig iron is simply used to increase the general assets of the corporation, thereby increasing only the general borrowing capacity.

If, however, we segregate our pig iron in bulk and borrow directly on that, while this is a greater advantage to the pig iron manufacturer than having it as a general asset, it still does not compare in advantage with placing the same bulk tonnage of pig iron in a warrant yard and issuing against it the warrant of a well established warrant company. Under the latter situation we have a condition where, instead of one blanket security, it is split up into many equally strong but more easily disposed of small units. With the warrants in our hands we have much greater flexibility in the handling of our pig iron asset. We can distribute it in small or large units; we can deliver it in small or large quantities; we can grade it in a way that will be most attractive to the buyer, and thus can offer a warrant of appropriate tonnage, grade and delivery. We hold our pig iron asset to be turned into money in a small or large way as our needs require.

In other trades of fluctuating supply and demand

we have fully developed a business of proper storage of excess supply. In pig iron, a commodity which is far more suitable than others for storage and lends itself with maximum adaptability to the requirements of storage, we seem to have neglected this large element of financial safety. We have sometimes wondered whether it was habit or tradition or stubbornness that has beclouded the eyes of both producer and consumer to the advantages for both of them in the legitimate uses of pig iron storage warrants.

CHARLES CHILD WHEELER,
President American Pig Iron Storage Warrant Co.
New York, July 3.

Effect of Blast Furnace Scrap on Quality of Pig Iron

To the Editor: In your issue of May 28, page 1584, I find the following in the report of Dr. Moldenke's remarks before the Pittsburgh Foundrymen's Association:

"The average quality of pig iron had fallen, he said, because furnacemen were pressed to get out iron at a price so low that, taken with the high cost of ore, coke and labor, there was no escape from the use of scrap. This made for poorer quality pig iron since the lime took out only the sulphur and did not disturb oxidation."

In view of the accepted theory that deoxidation or reduction in the furnace is accomplished by CO and solid carbon, this seems a most unusual statement. Then, too, since hematite ore (Fe_2O_3) can be easily reduced to a most excellent pig iron, it seems unreasonable to assume that the small amount of oxidized iron in scrap cannot be similarly reduced.

I trust this letter may bring forth a discussion based on facts rather than ideas.

H. H. HOPKINS,
Chemist Marting Iron & Steel Co.
Ironton, Ohio, June 27.

Recommended Unit Working Stresses

Building material stresses are covered in a tentative report of the building code committee of the Department of Commerce, just issued. This deals with unit stresses in wooden members, in rolled steel and in concrete, both plain and reinforced. The pamphlet, more than 70 pages, discusses, among other things, the recommendations for an increased basic stress in steel, as made before the American Iron and Steel Institute in May. This contemplates an increase from the present usual figure of 16,000 to 18,000 or 20,000 lb. per sq. in. In an appendix is given a large amount of information studied in the preparation of the report, including tables of working stresses for various kinds of timber, safe loads for columns, discussions of various conditions of loading and the design of web steel reinforcement for concrete.

In connection with the above-mentioned specifications, it is understood that both the American Concrete Institute and the timber industry were represented at the building code committee. The steel industry, however, is said not to have been represented and not consulted. It is a fact that the committee on column stresses of the American Society of Civil Engineers made a majority report recommending 20,000 lb. stress for steel members; the minority report recommended 18,000 lb. Quite a different method of attack is that of the American Institute of Steel Construction which, while indorsing 18,000 lb., is in reality much more concerned in obtaining uniform practice and the necessary safeguards to accompany competent design.

The number of electric hoists ordered in May was slightly more than 6 per cent over the number bought in the preceding month, according to E. Donald Tolles, secretary-treasurer of the Electric Hoist Manufacturers Association, 165 Broadway, New York. As another straw indicating the currents of business, it may be added that the value of hoists ordered showed an increase of 20.1 per cent. Shipments in May were 9 per cent off from those of April.

BOOK REVIEWS

Industrial Coal: Purchase, Delivery and Storage. A Report of American Engineering Council. Pages 419, 5½ x 8¼ in., illustrations, 87. Published by the Ronald Press, New York. Price, \$5.

This is one of the most important works, both for the industrial community and for the country in general, that has been produced. Its sponsors and co-workers first call attention to the benefits that would result from a proper system properly introduced and carried out, and then show concretely how these benefits could be attained, and at what cost.

Among the evils of the present system—or lack of system—as pointed out by the council, are irregularity of quantity and quality of supply, curtailment of manufacturing production, and unstable load factor; and these evils must be done away with.

The first method of so doing, suggested, is: storage, as the seasonal demand is responsible for 47 per cent of the idle time of the mines and for over-development. The objections urged thereto are cost, danger, breakage, and loss of calorific value. The importance of storage is stressed, in connection with the result on production and distribution in the country. The present extent of the storage plants and the physical and operating problems, transportation question, cost of installing and maintaining the equipment, and that of actual storage, including financing, insuring and taxing, are gone into in great and illuminating detail.

According to this report, the amount required to be stored is small; only 9 to 10 per cent, plus a reserve of 7 per cent, making 83,000,000 tons up to Sept. 30 of each year. The equipment costs about \$2.50 per ton; the danger nil; the storage costs from 50 cents to \$1.50 per ton per year, according to quantity and other conditions. An alternate remedy by affording additional transportation facilities would call for an outlay of \$2,000,000,000. Storage would be best at the points of consumption, not at or near the mines. Car assignment should be in proportion to sales. Householders could aid in the solution of this problem; so could national, State and municipal authorities, which are not doing their duty in this matter. And the enforcement of contracts should be rigid.

The fact that strikes have been responsible for much over-development of mining properties is brought out; but singularly enough there is not a line drawing attention to the fact that if consumers had large quantities of reserve coal stored right at hand, they could not so readily be held up by the miners. This was first called to my attention by Conway O. Grimshaw, engineer of the Westminster Electric Co. of London, supplying current to the Houses of Parliament and many other national public buildings. Having rented and filled with coal an unused gymnasium building adjoining the Eaton Square plant, he felt easy on the strike question. Events justified the precaution.

The book has a very full and useful bibliography and a good working index, and the wealth of tabular and diagrammatic material adds greatly to its value.

R. G.

Der Uebersee Maschinen Handel. (Export Machine Trade). By Wilhelm Thiemann. Pages 245, 6 x 9 in., diagrams. Published by Julius Springer, Berlin, 1924. Price, \$2.68.

This is a book which is well worth translating into English and being read by Americans, for the simple reasons that it marks a complete change in the German psychology as regards so-called "trade secrets," and contains an immense amount of statistical information and a great number of hints, intended for German consumption, and which would be serviceable to exporting manufacturers—indeed, to those who neither export nor contemplate doing so. One never can tell.

There is naturally the usual amount of prelude concerning the invention of printing, the steam-engine, etc., but we who are used to George Bernard Shaw's

plays understand that the preface is often worth while. But, as Byron says: "What is fame? To be misprinted in the Gazette"; so we have Robert Fulton steaming up the Hudson.

There is treated the foreign machine trade before and after the World War; the difference between cost and value, with consideration of all cost elements; the influence of State undertakings and that of trusts, cartels, communities of interest, purchasing and selling syndicates, and geographical cartels, tariff trusts and distribution and price cartels, and the hundred odd other variations, vertical and horizontal, in which the Germans can teach us lots; foreign organizations in production plants. This is followed by due consideration of methods of control and accounting between the manufacturer and the exporter on the one hand and the exporter and the customer or the foreign representative's agent on the other.

Herr Thiemann has done a great deal of work, and for this special purpose has done it so well that it would be a good idea for some one to prepare a work for American consumption on the same lines, with particular reference to special conditions prevailing only on this side of the Atlantic, and with particular warnings as to not merely what to do, but what not to do, to hold fields and create and retain new ones for American foreign machine business. Meanwhile, those who can read pages 15 to 43 inclusive, of this work, will derive benefit therefrom.

A little pamphlet on the Engineering Foundation, an institution of research forming a part of the large national engineering societies, with headquarters in the Engineering Societies' Building, 29 West Thirty-ninth Street, New York, enumerates briefly the work done by the foundation, touches on the work yet to be done and sketches a plan of activities. The pamphlet is published for general distribution. Members of the profession have need to be proud of the achievements of this department of the United Engineering Society.

An "Automobile Trouble Chart," compiled by Victor W. Page, has been published by the Norman W. Henley Publishing Co., 2 West Forty-fifth Street, New York. It shows a typical six-cylinder automobile engine of the four-cycle type, with a list of all the troubles that are likely to occur. It describes the part affected, the nature of the trouble, the symptoms and effects and how to remedy the difficulty. It sells for 35 cents.

The monograph on selecting and placing college graduates in business, by John Mills, personnel director Bell Telephone Laboratories, Inc., New York, printed at some length in THE IRON AGE of March 12, 1925, is now available in pamphlet form at the headquarters of the American Management Association, 20 Vesey Street, New York.

"Trading Under the Laws of Cuba," by Guerra Everett, with a chapter on Industrial Property by Bernard A. Kosicki, and a legal bibliography, Trade Information Bulletin No. 343, price 10 cents, may be purchased from the Superintendent of Documents, Government Printing Office, Washington, or any of the district offices of the Bureau of Foreign and Domestic Commerce.

Crucible Steel Catalog

A new catalog of 328 pages, 4½ x 6½ in., has been put out by the Crucible Steel Co. of America. It goes into great detail with regard to the products of the company and their uses in numerous industries, with particulars of heat-treatment recommended for various purposes. Trade marked specialties are given much attention, while the book naturally is full of tabular matter covering the steel bars and other products of the company, as well as general information, such as wire gage standards and other engineering data.

BIG DRAIN ON IRON MINES

Growing List of Minnesota's Exhausted Properties

The 1925 directory of iron mines in Minnesota has just been issued by the State School of Mines. An analysis of the information it presents may be of interest.

Mines reported as having shipped ore during last year number 114. This figure varies somewhat from that of the Lake Superior Iron Ore Association, because the State sometimes divides a single operation into ownership units. Fayal mine, for instance, is listed under five headings, of which three shipped during the year, although all are operated as one by a single concern which combines all in its statistics. The State lists 431 properties, including those classed as mines, reserves, reserve ore bodies, inactive, or exhausted. It also includes, and for the first time, a number of deposits which are classed as "low grade, non-merchantable material." Into this class alone are thrown some 53 million tons, the greater part of which had never appeared in these lists and probably was untaxed as any definite ore reserve. Of these deposits there are now listed 30 in the Cuyuna district and 36 in the Mesabi. They vary in quantity from nearly 4,000,000 tons to trifling amounts, in one case 39,000 tons. Just what the inclusion of these non-merchantable properties may mean is a matter of interest to mine operators of the State.

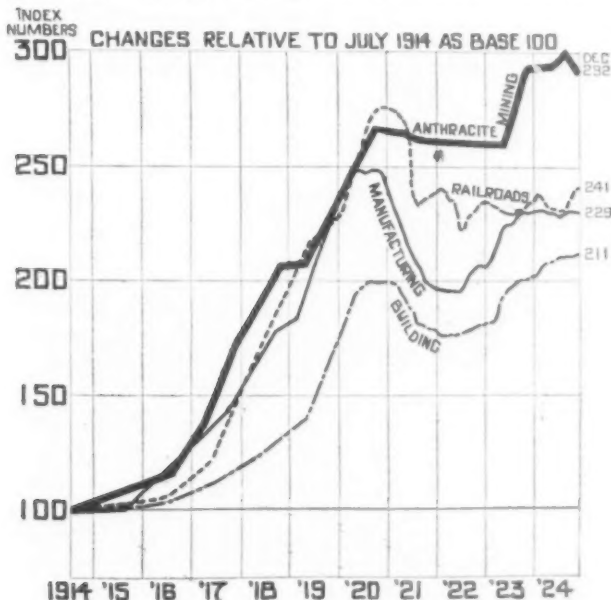
Exhausted mines number 61, or 55 per cent of the number given as shipping during the year and about 30 per cent of all that ever have shipped. These properties, that have been turned inside out and stripped clean, have produced a total of 51 million tons of ore, or an average of some 836,000 tons each, and so are by no means negligible from the standpoint of size. That there are so many, and of such tonnages, probably will be a matter for surprise. The largest had produced nearly 6,500,000 tons, and the smallest was a fractional tract out of which only 13,000 tons was taken. In addition to this rather startling list of exhausted mines no less than 14 developed mines are listed in which the average tonnage remaining is but 32,000 tons, which is a state of practical exhaustion.

Classified as inactive are 79 properties. They all are mines that have been developed and have made shipment but are idle for various reasons. Some, no doubt, never will resume. Some may in time. Some are quiet for some economic reason—grade of ore unsuitable for use at present, held in reserve because of class of ownership, fee for example, excess of water or other heavy mining cost, or some other clearly evident cause.

It is worthy of mention that whatever slight increase in tonnage is shown in this book is that which comes under the heading of "low grade non-merchantable" deposits. Aside from these the year shows a shrinkage in the total quantity of ore in the State, and probably no exploration whatever is under way at the present time in Minnesota.

Hourly Wages in Anthracite Mining Compared with Those in Other Industrial Groups

WAGES of anthracite miners, whose wage contract with the operators expires on Aug. 31, have risen considerably more during the past ten years than those of workers in the manufacturing industries, on rail-



Hourly Wages in Anthracite Mining Compared with Those of Other Industrial Groups in the United States

roads or in public utilities, according to a survey of wages just completed by the National Industrial Conference Board, New York. The diagram has been copyrighted by the Board.

Average hourly earnings of workers in the anthracite mines, according to the Board's analysis, rose 192 per cent from June, 1914, until December, 1924, while hourly wages in 25 basic manufacturing industries

during the same period increased only 129 per cent; hourly earnings of workers on Class 1 railroads, 141 per cent, those of workers in illuminating gas plants, 111 per cent, and in electric light and power establishments, 121 per cent.

Contract miners, who in June, 1914, drew an average of \$3.46 per day, when the day averaged 9 hr., in December, 1924, were drawing an average of \$9.11 for a day averaging 7.6 hr., representing a gain of 163 per cent in earnings per "start."

Technical Dictionary Library

Brentano's, Fifth Avenue and Twenty-seventh Street, New York, announces publication of Volume 14 in a series of technical dictionaries in six languages—English, German, French, Russian, Italian and Spanish. The present volume deals with the raw materials of the textile industry.

Among those which have preceded it are included the elements of machinery, electrical engineering, steam boilers, engines and turbines, internal combustion engines, railroad construction and operation, railroad rolling stock, hoisting and conveying machinery, reinforced concrete, machine tools, motor vehicles, including cars, boats and aircraft, metallurgy of iron, hydraulic, pneumatic and refrigerating machines and construction work. Three volumes still in prospect include spinning, weaving and mining.

A notable belt has recently been installed in a West Virginia lumber mill by J. E. Rhoads & Sons, 35 North Sixth Street, Philadelphia. This is 48 in. wide, 3-ply, 117 ft. in length. It is not so remarkable for its size as for its strength. It is made of "watershed tannate" leather and showed a breaking strength of more than 5000 lb. per sq. in. of cross section. To break this belt would probably require a pull of 100,000 lb.—about the weight of a carload of coal. To make the belt required the centers of 175 steer hides. In all, the belt contains 304 pieces of leather, each about 4 ft. long, and matched up to prevent one joint coming on top of another.

COATING WIRE WITH ZINC*

New Process "Galvannealing" Involves Heat Treatment—Uniform Malleable Heavy Coating Claimed

BY J. L. SCHUELER

SO far as the writer is aware, "galvannealing" involves the only basic change which has been made in hot zinc-coating since Melouin developed the first process in 1742. The galvannealing process is identical with the ordinary hot zinc process up to the point where the wire leaves the molten zinc, but from there on the processes differ radically, because in the galvannealing process the coated wires are not wiped, being immediately passed into a heat-treating furnace, the heat-treatment not only smoothing the coatings, but also making them flexible and malleable.

In the description of the new process which follows, each step of zinc-coating wire is considered. The wire passes from the reels into a bath of molten lead maintained at approximately 1,300 deg. Fahr. (705 deg. C.) for the purpose of removing the hardness caused by wire drawing. After leaving the annealing furnace the wire travels through the air for a distance of about 90 ft. (27 m.), thus giving it time to cool at a relatively slow rate. (We are speaking now of the ordinary soft steel used for fence wire or barbed wire. If high carbon wires are used, then the essence of the process is the same, but the details such as temperature of annealing, method of annealing, cooling and so on, are different.) The wire then enters a bath of commercial hydrochloric acid (muriatic acid) so as to thoroughly clean the wire surface. This cleaning is very important; in fact, it is the essence of any coating operation, as dirty surfaces cannot be coated. The wire when leaving the acid bath is very wet, and before entering the molten metal should be dried. This is done by passing the wire over hot iron plates.

The wire then enters the molten zinc bath held at a temperature of about 875 deg. Fahr. (468 deg. C.). Upon leaving the zinc bath the coated wire is immediately passed into a muffle furnace, where the coating is subjected to a heat of approximately 1,250 deg. Fahr. (677 deg. C.) for about 15 sec. After air-cooling, the wire is coiled up on the take-up reels ready for fabrication. This is a continuous process and the wire does not stop from the time it leaves the reels until it is removed at the take-up end.

Some Details of the Process

Cleaning: Thoroughness of cleaning is essential with the galvannealing process, and the wire surface should be free from all foreign matter. The acid strength is maintained equivalent to a mixture of equal parts of 18 deg. Baumé muriatic acid and water. The temperature of the solution varies somewhat, but is kept in the neighborhood of 180 deg. Fahr. (82 deg. C.).

Drying: The next step in the galvannealing process is the drying of the cleaned wire. The danger of plunging a wet object into molten metal is obvious; that is one reason for drying. Secondly, a wet wire has steam formed around it, and so long as this steam is present the wire is not in contact with the molten metal. The steam also forms black zinc chloride skimmings and the smelters to whom this material is sold penalize the seller for the chlorine content.

It is true, of course, that it is possible with the ordinary zinc coating process to carry out as much zinc on the wire as in the galvannealing process, but it is also essential that some means be taken to make the coating smooth, flexible and malleable.

Heat Treating: It is here that the galvannealing process introduces a new step in the process of zinc-coating wire, because immediately after the wire leaves the zinc bath it passes into a heat-treating furnace.

This heat-treatment not only smooths the coating, causing it to form evenly around the wire, but also makes the coating malleable and flexible. Occasionally there is a slight dusting of the coating which does not affect its durability, but if the heat-treating temperatures have been correct there is absolutely no cracking, flaking or peeling. The heavily coated wire may be bent around its own diameter without injury to the coating and it is not necessary that high-grade zinc be used.

For every size of wire there is probably a definite range of temperature which should be used in the heat-treating furnace above, depending on the speed with which the wire is traveling through the furnace. It is practically impossible to determine all of these combinations, but enough of them have been worked out so that our results are satisfactory.

If the temperature is too low the coating is brittle, and the same is true if the temperature is too high, the latter also causing an oxidized surface to be formed. The ranges of temperature within which satisfactory results may be obtained have not yet been determined, but we do know that they are far enough on either side of specific temperatures so that we have little trouble from that source.

After the coated wire leaves the heat-treating furnace it is allowed to cool gradually, traveling for over a minute through the air before passing into the cooling water, and from the water to the take-up reels.

[Analyses and weights of coatings by this process are contained in the paper as well as a discussion of the structure of the coatings.]

Corrosion Tests

We have subjected galvannealed coatings to several accelerated corrosion tests, such as the salt spray, acid fumes from pickling vats, ammonium chloride solutions and very weak acid solutions. In every case the galvannealed coating outlasts that applied by the ordinary hot zinc process. We are not submitting data on this subject because we are not yet convinced that an accelerated corrosion test is a proper index of the life of a coating. Furthermore, as most of these accelerated corrosion tests were made by other laboratories than our own and showed very favorable results, we feel that we can take the stand which we have, without undue criticism.

The real test for a protective coating is to subject it to the same conditions for which it is to be used. With this in mind, we have erected a number of panels of woven wire fencing and barbed wire, and also wires zinc-coated by various methods now in use. These samples have only been up about two years, but on the smaller gage wires results are showing plainly. The ordinary zinc-coated wires are all rusted, some of them badly, whereas the galvannealed wires, although somewhat darker in color, are apparently in as good a condition as when they were erected. The ends of the knots on the galvannealed coated fences, and which are not zinc-coated, have not yet rusted.

The barbed wire is in equally good condition. The cut ends of the barbs on the ordinary coated wires are all rusted, whereas a careful inspection has not revealed a single galvannealed barb which has any sign of rust.

The results of these tests are, of course, the real measure of the protective action of galvannealed coatings, and, as was said before, it stands to reason that a heavy, uniformly applied, non-porous zinc coating should outlast a thinner coating. The results so far obtained bear this out fully.

Automatic mechanical doublers and shears, to be built by the Aetna Foundry & Machine Co., Warren, Ohio, are to be installed in the tin mills of the Weirton Steel Co. Automatic tin house equipment of the Aetna manufacture also will feature the new tin mills of the Youngstown Sheet & Tube Co. at Indiana Harbor.

*From a paper, "A New Method for Zinc Coating Wire," presented at a spring meeting of the American Electrochemical Society, at Niagara Falls, N. Y., April 23 to 25. The author is metallurgist, Keystone Steel & Wire Co., Peoria, Ill.

Simplified practice in hot water storage tanks is the subject of a pamphlet just issued by the Department of Commerce.

JAPAN BUYS IN EUROPE

Rails and Tie Plates in Particular—American Tin Plate in Demand—China Quiet

NEW YORK, July 7.—The continued trend of Japanese business toward European steel producing centers and reports of tin plate purchases from American mills are features of current export trade. Despite disturbed conditions in China, merchants still display interest in purchases of second-hand and special materials, but their offering prices have been too low to invite sales. A tin plate order from China, large in contrast to the general run of such purchases by Chinese users, is reported to have been placed with an American producer. The same mill, according to a report that cannot be confirmed, has booked an order for 175,000 base boxes of tin plate to be shipped to Japan.

The 27,000 base boxes of tin plate awarded several weeks ago to Iwai & Co. by the Nippon Oil Co., is understood to have been placed with an American mill,

as well as 5000 base boxes for the Kioto Oil Co., awarded to Iwai & Co. The Toyo Can Co., of Osaka, is reported to be considering the purchase of its annual requirements of tin plate, which are generally placed directly with an American mill.

In railroad purchases by Japanese companies, the tendency is evidently toward the lower prices of European sellers, generally French, occasionally German mills. The 680 tons of 91-lb. high T-rails recently inquired for by Osaka municipality were awarded to Mitsui & Co., who placed the business with a French mill at a price of \$42 to \$43 per ton, c.i.f. Japan, between \$4 and \$5 per ton less than the American bid. An American mill received the 50 tons of accessories. The 10,000 tie plates, for which the South Manchuria Railway Co. has been in the market for several months were finally placed with a European mill. This railroad is expected to come into the market early in the fourth quarter for about 50 miles of 90-lb. rails. An order from an unnamed Japanese consumer for 2000 tons of 13-lb. rails is reported to have been placed in Europe.

Foundrymen's Officers Nominated for 1925-1926

The 1925 nominating committee of the American Foundrymen's Association held a meeting at Syracuse, N. Y., on June 13. The chairman, W. R. Bean, reports that the following were unanimously nominated for officers and directors of the association for the coming year:

President—A. B. Root, Jr., mechanical engineer, Hunt-Spiller Mfg. Corporation, Boston.

Vice-President—S. W. Utley, vice-president and general manager, Detroit Steel Casting Co., Detroit.

Directors to serve for three years—Fred Erb, foundry manager Packard Motor Car Co., Detroit; C. E. Hoyt, secretary American Foundrymen's Association, Chicago; Jesse L. Jones, metallurgist Westinghouse Electric & Mfg. Co., Pittsburgh; L. W. Olson, works manager Ohio Brass Co., Mansfield, Ohio, and H. S. Simpson, president National-Engineering Co., Chicago.

New Supply of Vanadium

A new supply of vanadium is claimed to have been developed by a Swedish engineer, Rutger Von Seth. According to the London *Ironmonger*, he has taken out world patents for recovering vanadium from what are known in Sweden as "export iron ores," a grade of iron rich in iron and high in sulphur. Some 6,000,000 tons are exported annually to various countries. The inventor claims that he will be able to extract 100 tons of vanadium as a by-product from Sweden's annual manufacture of 100,000 tons of pig iron from these export ores. The amount is claimed to represent a sixth of the world's present output of vanadium. The inventor states that his method is comparatively inexpensive since the vanadium is extracted from the blast furnace slag. He also estimates that by his process sufficient vanadium can be obtained from blast furnace operations to pay 25 per cent of the cost of producing the pig iron at the furnace.

Plan Engineering Community Trust

To aid research it is planned to organize the country's engineers, numbering more than 200,000, as a Community Trust under the head of the Engineering Foundation. The plan is described as a national development of the community trust idea, originating in Cleveland, more than a decade ago, and spreading until now, it is stated, there are more than 50 community trusts, locally restricted.

A \$20,000,000 endowment for the Engineering Community Trust, the first to be projected by an American professional group, is suggested by Farley Osgood,

president of the American Institute of Electrical Engineers, which with the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the American Institute of Mining and Metallurgical Engineers sponsor the Foundation, founded by Ambrose Swasey, Cleveland, with a gift of \$500,000, as their joint research organization.

Steel Furniture Shipments

Shipments of steel furniture are reported by the Department of Commerce to have amounted to \$1,912,427 in May, compared with \$2,006,468 in April. The May figure is the lowest since December. Orders received in May were \$1,851,498 and unfilled orders at the end of the month \$1,380,284. Steel shelving shipped in May is given as \$545,986, compared with \$644,758 in April.

To Sell Output of Sharpville Furnace

PITTSBURGH, July 7.—The Sharpville Furnace Co., with its main office in the Oliver Building, this city, and furnace at Sharpville, Pa., announces the appointment of Rogers, Brown & Crocker Brothers, Inc., exclusive sales agent of its foundry, malleable, basic and Bessemer iron. The recent consolidation of Rogers, Brown & Co. with Crocker Brothers of New York will afford a large sales organization to devote its attention to the sale of this Valley iron exclusively in this territory. The Sharpville stack, which was recently rebuilt and modernized, resumed the making of iron on Monday of this week. W. H. Price, sales manager at Sharpville, will remain in that position looking after the sales through this agency.

To Protest Reduced Freight Rates from the South

CINCINNATI, July 7.—In respect to the suspension of new reduced pig iron rates by Southern carriers from Birmingham to Ohio River points, ordered by the Interstate Commerce Commission, a public hearing will be held in this city on July 13 at which southern Ohio and St. Louis interests are expected to voice strong protests against the proposed schedule.

Pennsylvania Railroad Buys Shoenberger Mill

PITTSBURGH, July 7.—The Pennsylvania Railroad Co. has purchased the Shoenberger mill property in this city and after dismantling the works will build a freight terminal on the site.

JUNE IRON OUTPUT

Net Loss of 7 Furnaces—10 Shut Down and 3 Blown In

Complete Data Show Daily Rate 5427 Tons Less Than in May

Actual returns for the pig iron production in June show that the estimate published in THE IRON AGE last week, July 2, was close to the real output. Final figures place the total at 2,673,457 gross tons or 89,115 tons per day. This is 243 tons in excess of the daily rate published last week when the output for the last two days was estimated by the companies reporting. The June output at 89,115 tons per day was 5427 tons less than the daily rate in May, a decrease of 5.7 per cent. The net loss of furnaces was 7 instead of 5, as estimated last week, 2 having been blown out on June 30.

The production of coke pig iron for the 30 days in June amounted to 2,673,457 tons or 89,115 tons per day, as compared with 2,930,897 tons or 94,542 tons per day for the 31 days in May. The June output is the lowest for the year but is still considerably higher than that of last year at this time.

There were 10 furnaces blown out or banked and 3 blown in, a net loss of 7, bringing the number of furnaces active on July 1 to 189. The daily capacity of these 189 stacks on July 1 is estimated at about 86,250 tons compared with 89,550 tons per day for the 196 furnaces active on June 1.

Of the 10 furnaces shut down last month, 5 were Steel Corporation stacks, 4 were independent steel company furnaces and one was a merchant furnace. One Steel Corporation and 2 independent steel company furnaces were blown in.

The production for the half year has been 19,011,948 tons which compares with 17,434,492 tons for the first half of 1924 and with 20,841,534 tons for the first half of 1923.

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1921—Gross Tons

	1921	1922	1923	1924	1925
Jan.	77,945	53,663	104,181	97,384	108,720
Feb.	69,187	58,214	106,935	106,026	114,791
Mar.	51,468	65,675	113,673	111,809	114,975
Apr.	39,768	69,070	118,324	107,781	108,632
May	39,394	74,409	124,764	84,358	94,542
June	35,494	78,701	122,548	67,541	89,115
½ year ...	52,089	66,578	115,147	95,794	105,039
July	27,889	77,592	118,656	57,577	.....
Aug.	30,780	58,586	111,274	60,875	.....
Sept.	32,850	67,791	104,184	68,442	.....
Oct.	40,215	85,092	101,586	79,907	.....
Nov.	47,183	94,990	96,476	83,656	.....
Dec.	53,196	99,577	94,225	95,539	.....
Year	45,325	73,645	109,713	85,075	.....

Pig Iron Production by Districts, Gross Tons

	June (30 days)	May (31 days)	April (30 days)	March (31 days)
New York	137,889	143,770	192,405	217,038
New Jersey .....	.....	.....	.....	.....
Lehigh Valley	63,882	70,618	81,612	81,610
Schuylkill Valley	59,789	61,427	67,030	86,622
Lower Susquehanna and Lebanon Val- leys	32,653	32,322	40,191	46,580
Pittsburgh district	482,870	582,356	668,623	785,487
Shenango Valley	87,773	88,589	125,322	163,222
Western Pa.	101,614	117,812	135,366	150,571
Maryland, Virginia and Kentucky	73,121	84,766	94,550	102,205
Wheeling district	101,738	110,328	126,385	142,323
Mahoning Valley	274,452	287,521	319,973	339,160
Central and North- ern Ohio	309,332	322,959	306,483	315,802
Southern Ohio	43,208	47,450	42,999	39,804
Illinois and Indiana	543,622	595,273	635,479	703,000
Mich., Minn., Mo., Wis., Colo. and Utah	127,631	138,073	130,840	130,128
Alabama	229,453	241,611	285,351	253,820
Tennessee	5,030	5,932	6,349	6,875
Total	2,673,457	2,930,897	3,258,958	3,564,247

Production of Coke and Anthracite Pig Iron in United States by Months, Beginning Jan. 1, 1923—Gross Tons

	1923	1924	1925
Jan.	3,229,604	3,018,890	3,370,336
Feb.	2,994,187	3,074,757	3,214,143
Mar.	3,523,868	3,466,086	3,564,247
Apr.	3,549,736	3,233,428	3,258,958
May	3,867,694	2,615,110	2,930,897
June	3,676,445	2,026,221	2,673,457
½ year	20,841,534	17,434,492	19,011,948
July	3,678,334	1,784,899	.....
Aug.	3,449,493	1,887,145	.....
Sept.	3,125,512	2,053,264	.....
Oct.	3,149,158	2,477,127	.....
Nov.	2,894,295	2,509,673	.....
Dec.	2,920,982	2,961,702	.....
Year*	40,059,308	31,108,302	.....

*These totals do not include charcoal pig iron. The 1924 production of this iron was 212,710 tons.

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
May, 1924	62,176	22,182	84,358
June	50,237	17,304	67,541
July	43,353	14,224	57,577
August	45,591	15,284	60,875
September	50,312	18,130	68,442
October	59,952	19,955	79,907
November	63,230	20,426	83,656
December	76,682	18,857	95,539
January, 1925	86,856	21,864	108,720
February	90,707	24,084	114,791
March	90,741	24,234	114,975
April	83,827	24,805	108,632
May	74,415	20,127	94,542
June	70,452	18,663	89,115

Production of Steel Companies—Gross Tons

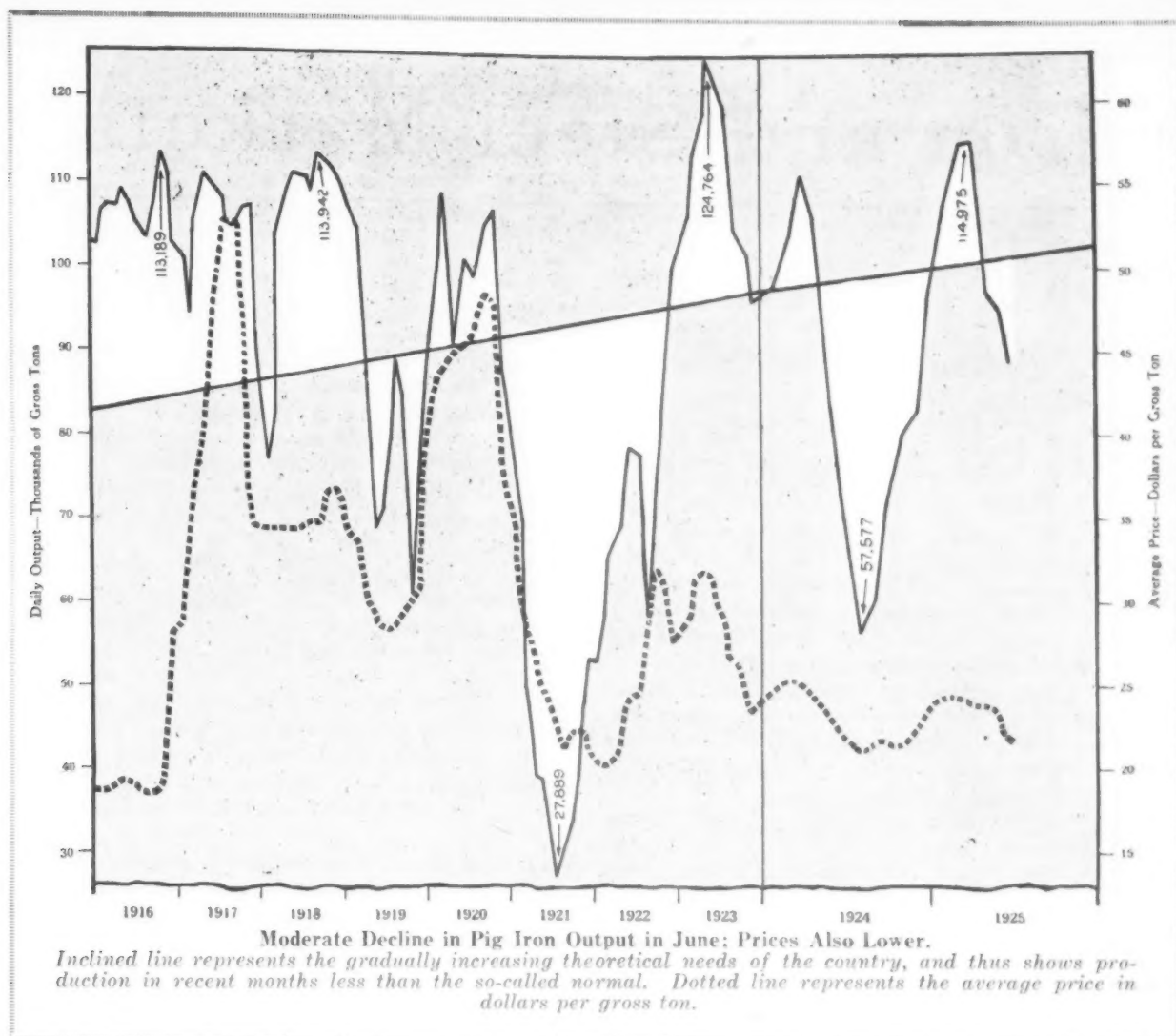
	Total Production†		1924		1925	
	1924	1925	Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan. ...	2,274,005	2,692,537	20,735	7,948	23,578	5,418
Feb. ...	2,410,658	2,539,785	22,405	9,870	18,184	4,910
Mar. ...	2,674,565	2,812,995	22,351	13,796	20,062	5,449
Apr. ...	2,463,027	2,514,828	23,580	4,240	21,448	5,341
May ...	1,927,461	2,306,887	14,993	9,336	22,679	5,294
June ...	1,507,110	2,113,566	20,049	9,405	19,836	4,972
½ year ..	13,256,826	14,980,598	124,113	54,595	125,787	31,384
July	1,343,952	.....	14,367	15,328	.....	.....
Aug.	1,413,314	.....	10,718	8,010	.....	.....
Sept.	1,509,360	.....	12,263	5,033	.....	.....
Oct.	1,858,502	.....	7,780	10,047	.....	.....
Nov.	1,896,886	.....	13,448	8,835	.....	.....
Dec.	2,377,141	.....	21,220	5,284	.....	.....
Year	23,656,981	.....	204,909	107,132	.....	.....

*Includes output of merchant furnaces.

†Ferromanganese and spiegel included.

Coke and Anthracite Furnaces in Blast

Location of Furnaces	Total Stacks	July 1—		June 1—	
		In Blast	Capacity per Day	In Blast	Capacity per Day
New York:					
Buffalo	22	10	4,520	10	4,350
Other New York	5	0	.....	0	.....
New Jersey	4	0	.....	0	.....
Pennsylvania:					
Lehigh Valley	12	5	1,960	5	2,100
Spiegel	2	1	165	1	170
Schuylkill Valley	15	6	1,915	6	1,880
Lower Susquehanna	8	2	880	2	780
Ferromanganese	1	1	65	1	65
Lebanon Valley	4	1	200	1	205
Ferromanganese	2	0	.....	0	.....
Pittsburgh district	53	28	14,760	31	15,950
Ferro and Spiegel	4	2	325	2	355
Shenango Valley	16	6	2,850	6	2,650
Western Pa.	21	6	2,560	8	3,100
Ferro and Spiegel	2	1	160	1	155
Maryland	5	3	1,360	4	1,605
Ferro	1	1	115	1	135
Wheeling district	14	8	3,390	8	3,460
Ohio:					
Mahoning Valley	28	17	9,190	16	9,000
Central and Northern	25	18	10,300	18	10,300
Southern	13	5	1,440	5	1,530
Illinois and Ind.	42	29	17,500	31	18,600
Mich., Wis. and Minn.	12	7	2,610	7	2,650
Colo., Mo. and Utah	7	4	1,630	4	1,695
The South:					
Virginia	17	2	255	2	315
Ferromanganese	1	0	.....	0	.....
Kentucky	7	1	315	1	320
Alabama	38	24	7,680	24	8,000
Ferromanganese	1	0	.....	0	.....
Tennessee	14	1	165	1	180
Total	396	189	86,250	196	89,550



Among the furnaces blown in during June were the following: One furnace of the Alan Wood Iron & Steel Co. in the Schuylkill Valley; one Carrie furnace of the Carnegie Steel Co. in the Pittsburgh district, and the Mary furnace in the Mahoning Valley.

Among the furnaces blown out or banked during June were the following: One furnace of the Alan Wood Iron & Steel Co. in the Schuylkill Valley; three furnaces of the Carnegie Steel Co. and one furnace of the Jones & Laughlin Steel Corporation in the Pittsburgh district; one furnace at the Cambria plant and one furnace at Maryland plant of the Bethlehem Steel Corporation; the Perry furnace in western Pennsylvania; one South Chicago furnace of the Illinois Steel Co. and one Gary furnace in the Chicago district.

Careful Inspection of Pipe

YOUNGSTOWN, July 7.—Pipe makers in this district comment upon the rigid inspection which buyers are according their products, approximating, as one producer characterizes it, machine shop precision. Most of the principal steel tube consumers have inspectors at the mills who pass upon the product before it is shipped. Such inspection this year is more rigid than ever, not only on butt-weld sizes, but on lap-weld as well.

Both the Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co., the principal independent pipe makers in this district, state that current business is quite satisfactory, but that the requirements of buyers are growing more rigid, necessitating great care in manufacture.

A combined shop and office vacation has been declared by the Blanchard Machine Co., Cambridge, Mass., for the two weeks beginning July 27.

Youngstown Plants at 70 Per Cent

YOUNGSTOWN, July 7.—The Youngstown Sheet & Tube Co. is maintaining production at 70 per cent of capacity in the Youngstown and Chicago districts, compared with 40 per cent a year ago. It is operating 9 of 16 blast furnaces, 16 of 28 open-hearth furnaces, its Bessemer converters at 85 per cent, 14 of 22 tube mills and 25 of 30 sheet mills. Merchant steel bar, skelp and rod mill capacity is active virtually at a capacity rate.

The Youngstown Pressed Steel Co., Warren, a subsidiary of the Sharon Steel Hoop Co., Sharon, Pa., established a new production record last month in its pressed steel department.

The United Engineering & Foundry Co., Pittsburgh, has completed at its Youngstown works the 44-in. 2-high reversing blooming mill for the Homestead, Pa., works of the Carnegie Steel Co. Total weight of the mill is 1,600,000 lb., mill housing alone weighing 170,000 lb. each. It will take an ingot of 25,000 lb. maximum weight.

Rolling Mill to Be Scrapped

The H. Sofransky Co., Allentown, Pa., dealer in scrap iron and steel, has purchased the plant and equipment of the National Steel Rolling Co., Schuylkill Haven, Pa., and will offer for sale all of the equipment, consisting of engines, rolls, mills, shears, etc. The same company has purchased the New Jersey Interurban Co., which owned an electric line from Phillipsburg to Port Murray, N. J., and the equipment of this road, including 18 miles of 70-lb. rail, cars, etc., will be offered for sale.

Iron and Steel Markets

1925 IN THIRD PLACE

Six Months' Steel Output Only Exceeded in 1923 and 1918

Little Change in Rate of New Buying—More Stability in Prices

That consumption will continue through July and August on a scale well above that of the summer of 1924 is indicated as the steel trade enters on the second half of the year. Today's mill operations are slightly below those of the week before the holiday. However, the number of new orders and the firmer attitude of some leading producers in respect to prices are taken as favorable signs, together with the fact that in the heavier products June business showed an improvement over May, even though small.

Estimates of June production of steel by the larger companies bear out the week-to-week statements in this review, that operations last month averaged 70 per cent. Counting the country's capacity at 54,000,000 tons, this would mean over 3,100,000 tons of ingots for June and a total of more than 22¼ million tons for the first half of the year.

In only two other six-month periods has the country produced more steel than in the first six months of 1925. One of these was the first half of 1923, with its high record of 23,327,000 tons and the other was the second half of 1918, with 22,531,000 tons.

Now that mill schedules have been more closely gaged to the country's actual consumption of steel, the extent to which buyers can count on prompt shipment is getting more attention in connection with the depletion of consumers' stocks. July developments on this point will be closely watched.

Some access of strength is seen in the sheet market from the efforts of manufacturers to get 4.20c. for galvanized, 3.15c. for black and 2.30c. for blue annealed; but 3.10c. for black sheets is still being done.

Cold rolled strip steel is the other product on which attempts at price betterment are being concentrated.

In the Pittsburgh district tin plate and pipe mills still lead in activity, current operations being estimated above 85 per cent. The Southern Natural Gas Co. is inquiring for 70 miles of 12-in. pipe (7400 tons) and the Empire Gas & Fuel Co., of Oklahoma, for 60 miles (6400 tons).

Inquiries from the Central Railroad of Georgia for 1000 freight cars and from the Texas & Pacific for 750 and the ordering of 367 passenger and baggage cars by the Pennsylvania represent the chief activity in railroad equipment. The Southern Pacific, which was reported to be considering a purchase of new cars, will repair 1000 in its own shops.

Track supplies lately closed include 12,500 kegs of spikes and bolts and there is inquiry for 20,000 kegs. That the railroads are running close

on their stocks of steel appears from various orders ranging from 300 to 1000 tons of plates, shapes and bars.

Structural steel work, both in awards and inquiries, was the smallest in months in the holiday week. The largest inquiry is for 7700 tons for a pier for the Erie Railroad on the Hudson River.

At Cleveland, with six lake vessels recently under inquiry, the Canadian National Railway has asked bids on two barges calling for 6000 tons of steel.

A third-quarter contract price below \$35 at Youngstown for sheet bars seems less likely now than a fortnight ago, when sheet producers were seeking a reduction to \$33.

Pig iron business in all selling centers has dropped off in the past fortnight. The good buying movement of May and early June did not help prices. Statistically the main factors in the situation since May 1 are reduced production, increase in sales and unfilled tonnage, but no marked change in shipments or in stocks at furnaces.

Midsummer iron ore buying is rare, but a Pittsburgh district consumer has contracted for upward of 100,000 tons in the past week, and sales of low grade ore amounted to 24,000 tons.

The German Raw Steel Association has been extended until October, 1929. The proposed international rail syndicate is still under discussion. Meanwhile Belgium and France are considering the taking of round lots of German rails on reparations account.

Pig iron, according to THE IRON AGE composite price, is down to \$18.96 a ton, from \$19.13 last week, the change being entirely in the Southern market. This is the first dip below \$19 since early April of 1922—39 months ago.

Finished steel remains at 2.431c. per lb., THE IRON AGE composite price showing no change. It has been within 2 per cent of that figure for about three months.

Pittsburgh

Some Reduction in Steel Making—Pig Iron Firm

PITTSBURGH, July 7.—Following the Fourth of July holiday, production in a number of units, including some sheet mills, has been curtailed. Taken generally, the rate of output this week, largely by reason of the holiday, is somewhat lighter than it was last week. It is estimated that the industry in this and the Valley districts is operating at between 55 and 60 per cent of ingot capacity.

The two outstanding lines of activity are tin plate and pipe. These units are operating at a rate estimated between 85 and 90 per cent. The Carnegie Steel Co. is operating at 65 per cent but has only 27 of its 56 blast furnaces in operation.

The effort of sheet makers to stabilize galvanized sheets at 4.20c., base, appears to have met with at least temporary success and it is understood that the indus-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 7, 1925	June 30, 1925	June 9, 1925	July 8, 1924
No. 2X, Philadelphia...	\$21.26	\$21.26	\$21.26	\$21.26
No. 2, Valley furnace...	18.50	18.50	18.00	19.00
No. 2, Southern, Cin'ti...	24.05	24.05	24.05	22.05
No. 2, Birmingham, Ala...	18.00	19.00	20.00	18.00
No. 2 foundry, Chicago...	20.50	20.50	20.00	19.50
Basic, del'd, eastern Pa...	21.50	21.50	21.50	20.00
Basic, Valley furnace...	18.00	18.00	18.00	19.00
Valley Bessemer del. P'gh	20.76	20.76	20.76	22.26
Malleable, Chicago*	20.50	20.50	20.00	19.50
Malleable, Valley	18.50	18.50	18.50	19.00
Gray forge, Pittsburgh...	19.76	19.76	19.26	20.26
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	115.00	115.00	115.00	107.50

Rails, Billets, etc., Per Gross Ton:	July 7, 1925	June 30, 1925	June 9, 1925	July 8, 1924
O.-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	35.00	35.00	35.00	38.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	38.00
O.-h. sheet bars, P'gh...	35.00	35.00	35.00	40.00
Forging billets, base, P'gh	40.00	40.00	40.00	43.00
O.-h. billets, Phila...	40.30	40.30	40.17	43.17
Wire rods, Pittsburgh...	45.00	45.00	46.00	48.00
Cents				
Skelp, gr. steel, P'gh, lb...	1.90	1.90	1.90	2.15
Light rails at mill...	1.70	1.70	1.70	1.90

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.42	
Iron bars, Chicago...	2.00	2.00	2.00	2.20	
Steel bars, Pittsburgh...	2.00	2.00	2.00	2.15	
Steel bars, Chicago...	2.10	2.10	2.10	2.20	
Steel bars, New York...	2.34	2.34	2.34	2.49	
Tank plates, Pittsburgh...	1.90	1.90	1.90	2.15	
Tank plates, Chicago...	2.10	2.10	2.20	2.25	
Tank plates, New York...	2.14	2.14	2.24	2.19	
Beams, Pittsburgh	2.00	2.00	2.00	2.15	
Beams, Chicago	2.10	2.10	2.20	2.25	
Beams, New York...	2.34	2.34	2.34	2.34	
Steel hoops, Pittsburgh...	2.40	2.40	2.40	2.75	

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	July 7, 1925	June 30, 1925	June 9, 1925	July 8, 1924
Per Lb. to Large Buyers:				
Cents				
Sheets, black, No. 28, P'gh	3.10	3.10	3.20	3.50
Sheets, black, No. 28, Chi-				
cago dist. mill...	3.30	3.20	3.30	...
Sheets, galv., No. 28, P'gh	4.15	4.15	4.25	4.60
Sheets, galv., No. 28, Chi-				
cago dist. mill...	4.35	4.25	4.35	...
Sheets, blue, 9 & 10, P'gh	2.30	2.30	2.30	2.75
Sheets, blue, 9 & 10, Chi-				
cago dist. mill...	2.45	2.35	2.40	...
Wire nails, Pittsburgh...	2.65	2.65	2.70	2.90
Wire nails, Chicago dist.				
mill	2.70	2.70	2.75	...
Plain wire, Pittsburgh...	2.50	2.50	2.50	2.65
Plain wire, Chicago dist.				
mill	2.55	2.55	2.60	...
Barbed wire, galv., P'gh...	3.35	3.35	3.45	3.70
Barbed wire, galv., Chi-				
cago dist. mill...	3.40	3.50	3.55	...
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	July 7, 1925	June 30, 1925	June 9, 1925	July 8, 1924
Carwheels, Chicago	\$17.00	\$17.00	\$17.75	\$16.50
Carwheels, Philadelphia	17.00	17.00	17.00	17.00
Heavy steel scrap, P'gh...	17.50	17.50	17.00	17.00
Heavy steel scrap, Phila...	15.50	15.50	15.00	15.50
Heavy steel scrap, Ch'go...	15.50	15.50	16.00	14.50
No. 1 cast, Pittsburgh...	17.00	17.00	17.00	17.50
No. 1 cast, Philadelphia...	17.50	17.50	17.50	18.00
No. 1 cast, Ch'go (net ton)	17.50	17.50	17.50	16.75
No. 1 RR. wrot, Phila...	18.00	18.50	18.00	17.50
No. 1 RR. wrot, Ch'go (net)	14.00	14.00	15.25	12.50

Coke, Connellsville,	Per Net Ton at Oven:	July 7, 1925	June 30, 1925	June 9, 1925	July 8, 1924
Furnace coke, prompt...	\$2.75	\$2.75	\$2.75	\$3.00	
Foundry coke, prompt...	3.75	3.75	3.75	4.25	

Metals,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.00	13.87 1/2	13.62 1/2	12.50	
Electrolytic copper, refinery	13.62 1/2	13.50	13.25	12.00	
Zinc, St. Louis...	7.10	7.00	7.00	5.77 1/2	
Zinc, New York...	7.45	7.35	7.35	6.12 1/2	
Lead, St. Louis...	7.85	7.75	8.25	6.65	
Lead, New York...	8.10	8.00	8.50	7.00	
Tin (Straits), New York...	57.50	57.00	55.37 1/2	43.62 1/2	
Antimony (Asiatic), N. Y.	18.50	16.50	16.50	8.30	

THE IRON AGE Composite Prices

July 7, 1925, Finished Steel, 2.431c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	One week ago,	2.431c.
	One month ago,	2.446c.
	One year ago,	2.589c.
	10-year pre-war average,	1.689c.

July 7, 1925, Pig Iron, \$18.96 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	One week ago,	\$19.13
	One month ago,	19.21
	One year ago,	19.29
	10-year pre-war average,	15.72

High				Low			
1923	1924	1925		1925	1924	1923	
2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6	Finished Steel	2.424c., June 23	2.460c., Oct. 14	2.446c., Jan. 2	
\$30.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	Pig Iron	\$18.96, July 7	\$19.21, Nov. 3	\$20.77, Nov. 20	

try, encouraged by this stand, will attempt to hold black sheets at a minimum of 3.15c., base, and blue annealed, No. 10, at a minimum of 2.30c. This move has extended to other lines where strong resistance is being offered against further price concessions, of which bands and strip steel are examples. The trade generally takes the attitude that prices in most lines are firmer, though the actual amount of tonnage moving shows no improvement. The fact that stocks in the hands of consumers are believed to be low has not changed the policy of hand-to-mouth buying.

Pig Iron.—Prices remain unchanged but appear to be somewhat firmer. Individual sales of both foundry

and basic grades represent only small lots ranging from carloads to 500 or 600 tons, yet when aggregated these tonnages constitute a rather large volume. The market for Bessemer iron is so dull that it has been given no test in the past week and consequently continues to be quoted nominally at \$19, Valley. Sales of basic at \$18, Valley, and of foundry at \$18.50, base Valley, have established these quotations rather firmly and there have been refusals by merchant furnace interests to make concessions. While the demand for iron is light, merchant producers point out that the market is becoming firmer because, while output is extremely low, the tonnage that is moving is coming from stocks. A

recent canvass is said to have disclosed the fact that every merchant furnace, except one in Ohio, now in the hands of receivers is well sold against producing capacity to the first of next year. Consumers concede the soundness of the position of the operators.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$18.00
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	18.50
Low phosphorus, copper free....	\$27.75 to 28.00

Ferroalloys.—The market for standard ferromanganese here is rather steady at \$115, seaboard, for foreign material, or \$115, furnace, for the domestic grade. Several small lots are reported to have been sold at this figure. The market for spiegeleisen is unchanged, with third quarter and last half delivery standard tonnage at \$32 to \$33.

Semi-Finished Steel.—The market is quiet and unchanged. Makers of sheet bars continue to quote \$35, Pittsburgh or Youngstown, and the price appears to be pegged at this figure. This also is the price being quoted by Pittsburgh makers for billets and slabs. The market for skelp and wire rods is rather dull. Prices are given on page 117.

Steel and Iron Bars.—While light demand exists for steel bars, the market is reported firm at 2c., base, Pittsburgh, and some producers say it has stiffened somewhat during the past week. The market for iron bars is comparatively quiet, with prices unchanged and given on page 116.

Plates.—While there have been some quotations at outside points as low as 1.80c., producers here are quoting 1.90c. It is reported, however, that this figure might be shaded on attractive tonnages. Prices are given on page 116.

Sheets.—Improvement has developed during the past week. One prominent company reports that despite the holiday it received the largest number of orders on Monday of the present week, both as to the number and volume that has been received in the corresponding day in the past three months. Satisfaction also was expressed over the fact that the orders were well diversified, and came from both consumers and jobbers. It appears that the minimum price of 4.20c., base, Pittsburgh, is fairly well established at least for the present on galvanized sheets. The withdrawal of the lower prices having seemed to be successful on this grade, it is reported that there will be a movement among producers to stabilize black sheets, which now range in price from 3.10c. to 3.20c., at 3.15c., base, Pittsburgh. A further advance may be attempted. It is also understood that an effort may be made to raise the minimum price on blue annealed, No. 10, from 2.25c., Pittsburgh, to 2.30c. Sales and contracts have been made at the higher quotation in all three grades. The automobile industry is specifying for good-sized tonnages and prospects for the next three months are good. Prices are given on page 116.

Tin Plate.—Slight cutting in prices in tin plate is noted only in isolated cases and the price remains at \$5.50 base, per box, Pittsburgh. Production is estimated at between 80 and 85 per cent of capacity.

Wire Products.—While the seasonal dullness has developed a quiet tone in the market for agricultural wire, producers say that indications are good for a fair demand this fall, in view of crop conditions. Plain wire is the firmest item in the wire list and was not actually affected by the recent price adjustment. The market for nails is reported to be fairly good and stocks in the hands of jobbers are said to be low. Prices are given on page 116.

Rail and Track Supplies.—The market for both standard and small spikes, as well as light rails, con-

tinues dull, due to the lack of buying on the part of railroads and coal mines. Large spikes are quoted at 2.80c., Pittsburgh, and small spikes at 3c. base, Pittsburgh. Prices are given on page 116.

Structural Material.—Fabricators report that there is a slight increase in the amount of work moving, but that the prices are satisfactory. Plain material is unchanged at 2c. base, Pittsburgh. The American Bridge Co. has been awarded 800 tons for a brass foundry for the Westinghouse Electric & Mfg. Co. at Linhart, Pa. The Jones & Laughlin Steel Corporation was given a contract for 500 tons for the John Harris High School, Harrisburg, Pa., and 400 tons for an extension to the plant of the Bessemer Gas Engine Co. at Grove City, Pa. Plain material prices are given on page 116.

Bolts, Nuts and Rivets.—The market for bolts, nuts and rivets remains unchanged from last week. While demand is only moderate, prices appear to be holding well. Prices and discounts are given on page 117.

Hot Rolled Flats.—Producers of bands are reporting a price of 2.40c. for sizes under 6 in. and 2.20c. for sizes over 6 in., and claim that the market is firm at these figures. Prices are given on page 116.

Cold Rolled Strips.—The automobile trade is actively specifying against contracts for cold rolled strip steel and makers are quoting 3.75c., base, Pittsburgh or Cleveland.

Cold Finished Steel Bars and Shafting.—There is some activity on the part of the automobile and agricultural implement interests in specifying against contracts. The tonnage being called for by these lines at this season of the year is not large, but is expected to become heavier within the next month. The market is quoted at 2.60c., base, Pittsburgh.

Tubular Goods.—Jobbers are coming into the market for good sized tonnages of standard pipe for immediate shipment, which is taken to indicate that their stocks are low. Demand for lapweld goods also is active. The condition of the oil industry is a factor in stimulating the pipe market. Mill operations are estimated at 80 to 85 per cent of capacity. Some producers report that inquiry is a little stronger and prices somewhat firmer. Discounts are given on page 116. Later: The Southern Natural Gas Co. has put out an inquiry for 70 miles of 12-in. plain end pipe and the Empire Gas & Fuel Co., Bartlesville, Okla., is inquiring for 60 miles of the same size and kind of pipe. The former inquiry represents approximately 7400 net tons and the latter about 6400 net tons.

Coal and Coke.—Makers of beehive coke say that production of fuel is now closer to actual consumption than it has been for a long time. The output has been further curtailed. At the same time demand is extremely light because of the low operating rate of consumers. The price situation has not changed. Spot furnace coke continues to be offered at \$2.75 to \$3 per net ton, Connellsville ovens, while spot foundry coke is held at \$3.75 to \$4.25 for good 72-hr. fuel. While it is reported that the figure of \$2.75 occasionally is quoted on third quarter and last half business for furnace coke, contracts have been made in the past week for this grade at \$3 and this appears to be the prevailing quotation on forward shipments. Standard brands of 72-hr. foundry coke have been contracted for at as high as \$5, while other brands of foundry coke have gone at 75c. to \$1 less. Prices are given on p. 117.

Old Material.—Except for the purchase of turnings by a nearby steel maker, the market for scrap has been inactive. The price paid for these turnings was as high as \$14. The same consuming interest also paid \$16 for heavy breakable cast scrap. Purchases made previously by other consumers of heavy melting steel were made at \$17.50 to \$18. These prices still hold good because not much scrap is coming out and dealers apparently will not sell for less. The Norfolk & West-

ern Railroad has issued two July scrap lists involving comparatively small lots, one to close on July 15 and the other on July 17.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	\$17.50 to \$18.00
No. 1 cast, cupola size	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.00 to 19.00
Compressed sheet steel	16.50
Bundled sheets, sides and ends ..	15.50
Railroad knuckles and couplers ..	19.50 to 20.00
Railroad coil and leaf springs ..	19.50 to 20.00
Low phosphorus blooms and billet ends	22.00 to 22.50
Low phosphorus plate and other material	21.00 to 21.50
Railroad malleable	17.00 to 17.50
Steel car axles	20.00 to 20.50
Cast iron wheels	17.00 to 17.50
Rolled steel wheels	19.50 to 20.00
Machine shop turnings	13.50 to 14.00
Short shoveling turnings	13.50 to 14.00
Sheet bar crops	20.00 to 20.50
Heavy steel axle turnings	16.50 to 17.00
Short mixed borings and turnings ..	13.00 to 13.50
Heavy breakable cast	15.50 to 16.00
Stove plate	13.50 to 14.00
Cast iron borings	13.50 to 14.00
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	17.00 to 17.50

Hungarian Government to Lease Steel Mills

The iron and steel mills owned by the Hungarian government and operated at Diosgyor are understood to be for lease, says Consul Walter S. Reineck, Budapest, in a report to the Department of Commerce. These mills employ at present about 3800 men, while previous to the war they had approximately 12,000 workers. Apparently due to inefficient management and out-of-date methods, these mills have failed to show any earnings for a number of years. The accounts for 1924 closed with a deficit of about \$30,000, which was a direct burden upon the State Treasury, causing the Government to seriously consider leasing the mills.

The lease which would probably cover a long period might include such conditions as favorable freight rates on the state railways and the contract to supply the needs of these railways could probably be obtained. The plant at Diosgyor is practically a duplicate of the Hungarian General Machine Manufacturing Company's plant at Budapest, and if a lease is entered into, it will probably be made to cover both establishments. These organizations operate under the jurisdiction and supervision of the Royal Hungarian Minister of Commerce, and it is rumored that the Hungarian government has obtained two French, a British, and a German offer in connection with the proposed leasing.

Valley Operations Well Sustained

YOUNGSTOWN, July 7.—Iron and steel property operations, for the most part, are well sustained this week in the Mahoning Valley, following the usual suspensions last week for Independence Day observance. The Republic Iron & Steel Co. is operating six merchant bar mills and the equivalent of 5½ tube mills. The Carnegie Steel Co. is operating bar mills on three shifts and roughing mills at the Ohio Works double turn. The Republic company has placed its Bessemer department on double turn.

Sheet mill schedules show 83 mills under power, a gain of three over the preceding week. The Liberty plant of the Trumbull Steel Co. at Leavittsburg, comprising tin mill units, is inactive for overhauling. Sheet mill properties at Niles of the Falcon Steel Co. and the Mahoning Valley Steel Co. are likewise suspended for repairs. Both plants are scheduled to resume the following week. Thomas Sheet Steel Co., whose plant was cold last week, started 10 of 12 mills Sunday midnight. The Truscon Steel Co. has resumed production in the fireproofing department of the General Fireproofing Co., acquired by purchase July 1, and suspended for a short time for inventory.

SAFETY GUARDS AN AID

Expert Declares Machine Guards Speed Production

Machine guards actually speed up production, says a statement issued by John Sandel, of the National Safety Council's industrial division, who takes exception to allegations to the contrary. As a safety engineer in close touch with numerous industries, he does not place any credence in the arguments of some shop managers that production is lowered by the installation of safeguards.

"We have received many reports showing instances of increased production resulting from guarding machinery," declares Mr. Sandel's statement. One company alone, that operates approximately 750 presses, has increased its production 8 per cent as a result of the use of guards. In that particular company's plant there were 36 fingers amputated during 1919. Only two fingers were lost from 1921 to 1925. This instance shows conclusively that the guards resulted in increased production, the reduction of accidents and the elimination of human suffering in many cases.

"The use of safeguards for machinery is one of the most important steps in accident prevention work. Men naturally work faster when they do not have to worry about the dangers of being injured. A man who uses a safety razor can shave faster than a man who employs an old-fashioned instrument. Progressive employers are purchasing machinery and equipment that have the necessary guards because they realize that, while the initial cost is higher, these devices reduce accidents and result in greater production."

Sheet Price Fluctuations Cause Better Buying

YOUNGSTOWN, July 7.—President Jonathan Warner of the Trumbull Steel Co., Warren, advises that heavier buying of steel products, which started 10 days ago, affecting lighter products principally, is being maintained. "Stocks in hands of steel consumers are low and they must have prompt shipments to meet their requirements," he states. "It seems likely that a good steel demand should be maintained. Steel prices will improve, if it does."

In view of price irregularities in the sheet market, new buying has been quite heavy in this district. Mr. Warner states that prices are relatively firmer in strip steel and tinplate than in steel sheets.

Rolling mills of the Trumbull company are active at a near-capacity rate, while unfilled business is sufficient to maintain production close to capacity for some time to come.

Brazilian Iron and Steel Market Improves

The Brazilian market for iron and steel products has improved over the situation in May, even in the face of increasing European competition, according to Assistant Trade Commissioner A. Ogden Pierrot, Rio de Janeiro. Prices on American goods are 30 to 40 per cent higher than those on European products in some lines. The conditions in the tin plate trade are still unfavorable to the American product. A very good business is being done in heavy hardware and engineering supplies.

Less Freight Being Handled in American Vessels

American ships carried 36.5 per cent of our exports and 31.1 per cent of our imports in the ten months ended April 30. Foreign ships carried 63.5 per cent of the exports and 68.9 per cent of the imports. The American ships have been losing ground in the last year, for the ten months ended April 30, 1924, showed 39.44 per cent of exports and 32.4 per cent of imports in American vessels.

Chicago

Curtailed Production Strengthening Prices—July Begins Well

CHICAGO, July 7.—Market sentiment shows signs of improvement notwithstanding further curtailment in steel plant operations. In fact contraction of production is regarded rather as a favorable factor at this time. So long as the mills were anxious to maintain a high rate of operations, there was an incentive to cut prices. Now that they have become reconciled to the inevitability of low production, there is less pressure to sell.

Unfavorable balance sheets resulting from sales at low prices have also tempered the competitive inclinations of various producers. These and perhaps other considerations are believed to be responsible for a perceptible improvement in the price situation, particularly with respect to sheets, wire products and cold rolled strip. While the advances which mills have attempted to put into effect have not been fully realized, current going prices are not so low as those of two and three weeks ago. In plates and shapes likewise less is heard of sharp competition on the part of outside producers, and it is possible that 2.10c., Chicago, is sufficiently low to keep out mills with a large freight disadvantage to absorb.

Actual buying of finished steel is still largely on a hand-to-mouth basis, orders passed to entry being less than current shipments. However, in heavier products June showed a slight improvement over May and July promises still further betterment. In this connection it is interesting to note that business booked by representative local producers during the first six months of this year was 25 per cent in excess of that for the same period in 1924. The outstanding fact in relation to the present cycle of restricted buying, which has been in effect since early in the year, is that consumers' stocks are now at a very low level, a situation which is reflected in an increasing pressure for deliveries on current business. In fact, it is believed that the intensity of the recovery of the market will be governed by the extent to which buyers persist in following a waiting policy during coming weeks. The question is how far buyers can go in placing dependence upon the mills for prompt service and at the same time permit production to recede to lower and lower levels.

Fundamental business conditions are promising. In fact, both the railroads and the implement industry are encouraged over improved crop prospects. Pig iron tonnages recently placed by various implement makers are reminiscent of the days before the agricultural depression. Railroad car loadings are heavy and seem to insure prosperity for the carriers; yet railroad buying of rolling stock and supplies has been disappointing. Railroad stocks of steel are badly depleted. A prominent local railroad president is quoted as stating that it is a good time to buy new equipment but that he is not convinced that it is needed in view of the large traffic which is being handled with a surplus of cars. In this connection it is pointed out that traffic records have been broken at a time when buying in most lines of industry has been hand-to-mouth and the question arises as to whether or not the carriers can safely count on a car surplus with any development of forward buying and the inevitable crop and coal movements in the fall.

Recent straws may point to a change in the attitude of the railroads. The Pennsylvania has just placed 367 passenger service cars, an unusually large order for passenger equipment, and the Central of Georgia is in the market for 1000 box cars and the Texas & Pacific for 750 gondola cars. The Rock Island has closed for 6500 kegs of spikes and 6000 kegs of bolts, these orders being in addition to an original purchase for this year of 37,000 kegs. The Great Northern is inquiring for 5000 kegs of spikes and bolts and a tonnage of plates and shapes. Another Western line has closed for 1000 tons of plates, shapes and bars, 1000 axles and 35,000

pairs of angle bars. The Norfolk & Western, in addition to 46,500 tons of rails, wants 15,000 kegs of spikes.

The banking of an Inland stack for repairs has reduced the number of active steel works blast furnaces to 23 out of a total of 35 in this district. Owing to the loss of the furnace, the Inland Steel Co.'s output has been temporarily reduced to 65 per cent, as against 75 per cent for the leading interest.

Pig Iron.—Inventory-taking and vacations are interfering with trade, but nevertheless considerable tonnage is being booked. Shipping releases received thus far this month promise a gain in deliveries more than June, which in turn was a better month than May. Prices are firm. The St. Paul Railroad is inquiring for 3000 tons of malleable and 400 tons of foundry iron for its Milwaukee shops. A Michigan plant wants 500 tons of foundry for the remainder of the year. Silvery is still available on the basis of \$25, Jackson County, for 8 per cent, notwithstanding recent efforts to advance prices. Charcoal has been sold in small lots at unchanged prices. A local plant is in the market for 150 tons of low phosphorus.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00
Malleable, not over 2.25 sil.	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rails) 22.18 to	22.68
Low phos., sil. 1 to 2 per cent, copper free	31.50
Silvery, sil. 8 per cent.	29.79
Electric ferrosilicon, 14 to 16 per cent	42.50

Ferroalloys.—A local user has closed for 600 tons of spiegeleisen. This commodity has stiffened and recent sales indicate a range in prices from \$38.58 to \$40.04, delivered.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$38.58 to \$40.04, delivered.

Bars.—Both specifications and sales of soft steel bars are appreciably heavier than they were a week ago. In fact, this commodity is the strongest among the finished steel lines. Both the automobile and implement industries continue to take considerable material. The extent to which implement makers will expand their operations this fall will depend largely upon crop prospects. Recent rains have materially improved the outlook for the farmer. Bar iron demand is still unsatisfactory, but an early resumption of buying by the railroads is hoped for in view of the completion of their fiscal year June 30. Rail steel bar mills continue to receive a fair tonnage from implement makers, fence post producers, bedstead manufacturers and from reinforcing projects. Fence post business is steadily improving. Rail steel bars are bringing 2c., mill.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 2c. to 2.10c., Chicago; rail steel, 2c., Chicago district mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Plates.—Apparently the mills cannot hope for a satisfactory demand for plates until the railroads resume purchases of rolling stock. The Southern Pacific, which was rumored as contemplating the purchase of several thousand cars, has undertaken the repair of 1000 cars in its own shops on the Coast. Between 6000 and 7000 tons of steel will be required. No important oil storage tank awards are reported, but a local mill has booked 1500 tons of plates, representing the requirements of miscellaneous small orders. Nothing lower than 2.10c., Chicago, has been reported on tank

plates in this vicinity. So far as can be learned outside mills are not disposed to meet this price.

The mill quotation is 2.10c. to 2.20c., Chicago. Jobbers quote 3.10c. for plate out of stock.

Structural Material.—No large structural lettings are reported this week outside of the Rice Hotel annex, Houston, Tex., 1300 tons, which was placed with the Pennsylvania Car Co. A number of promising projects are pending, however, among them the Great Northern Ore Dock, Superior, 4000 tons; the One Hundredth Street Bridge, Chicago, 2000 tons; the Holton Street Viaduct, Milwaukee, 2000 tons, and the Shrine Temple, Des Moines, 900 tons. Competition among fabricators is no less keen than heretofore. On plain material 2.10c., Chicago, appears to represent the bottom of the market for this city and vicinity. Buyers are still limiting their orders to immediate needs and in most cases have badly depleted inventories.

The mill quotation on plain material is 2.10c. to 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts are only fair, but discounts are being held firmly. Rivets are still subject to price variations, but \$2.65, Chicago, on large, and 70 and 10 and 5 off, Chicago, on small rivets are representative quotations.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{3}{8}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{3}{8}$ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Rails and Track Supplies.—The Norfolk & Western, which last week entered the market for 46,500 tons of rails, is also inquiring for 15,000 kegs of spikes. Local sales of track supplies are approximately equal to those of the previous week, but specifications show a gain of 50 per cent, a very encouraging development in view of the recent tendency of the carriers to hold back releases against contracts. The outstanding order for the week was 13,000 kegs of spikes and bolts, placed by a Chicago road with a local mill.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.55c. base.

Sheets.—Mills are adopting a firmer attitude on prices and recent sales indicate advances of \$2 a ton. Black ranges from 3.30c. to 3.35c., Chicago district mill; galvanized from 4.35c. to 4.40c., and blue annealed is holding at a minimum of 2.45c.

Chicago delivered prices from mill are 3.35c. to 3.40c. for No. 28 black, 2.50c. for No. 10 blue annealed and 4.40c. to 4.45c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

Wire Products.—The most encouraging feature of the wire market lies in the depleted stocks of the jobbers. In fact, their inventories are considered far below a safe level, and it would not take much of a revival of demand to put them in a difficult situation. In the meantime they seem satisfied to continue ordering on a hand-to-mouth basis, depending on the mills and the railroads for prompt shipment. July is never an active month in the wire trade and current mill business is considered normal. However, the agricultural outlook has improved to such an extent that an active fall is anticipated, with the possibility that forward buying will develop late this month or in August. The price situation is more stable so far as nails and wire are concerned, wire nails ranging from \$2.70 to \$2.75, Chicago district mill, and plain wire from \$2.55 to \$2.60. Cement coated nails are still unsteady. From \$1.90 to \$1.95, district mill, is being done rather commonly, with occasional concessions below that range.

The warehouse situation on cement coated nails is also soft, the open quotation of \$2.25 being subject to frequent shading. Galvanized barbed wire ranges from \$3.40 to \$3.45, Chicago district mills.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.15 per keg; cement coated nails, \$2.25.

Cold Rolled Strip.—Recent efforts of producers to raise prices to 4c., Cleveland, have not succeeded, but appear to have at least raised the minimum going price to 3.75c., the equivalent of 4.05c., delivered Chicago. Some recent business has gone at that price.

Cast Iron Pipe.—On 1140 tons of 8-in., on which Chicago took bids July 3, the American Cast Iron Pipe Co. and the United States Cast Iron Pipe & Foundry Co. were tied for low with a figure of \$48.20, delivered, or \$40, base, Birmingham. The American company is also low on 200 tons of fittings for the same city. Elmwood Park, Ill., has placed 1500 tons through a contractor with the Lynchburg Foundry Co. Milwaukee took bids yesterday on 1000 tons of 6-in., 1000 tons of 12-in. and 104 tons of special castings. Hammond, Ind., will receive tenders July 13 on 100 tons of 6-in. and 75 tons of 4-in.

Late word indicates that Chicago has awarded 1140 tons of 8-in. to the United States Cast Iron Pipe & Foundry Co. and 200 tons of fittings to the American Cast Iron Pipe Co. The National Cast Iron Pipe Co. is low bidder on 2000 tons of 6 and 12-in. for Milwaukee with a figure of \$48.25, delivered, or the equivalent of \$39.75, base Birmingham.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$52.20; 6-in. and over, \$48.20; Class A and gas pipe, \$4 extra.

Reinforcing Bars.—Reinforcing work continues to develop in volume, but competition among bar dealers is unabated. John Griffiths & Son Co., Chicago, is low bidder on the general contract for the Grant Park stadium addition, Chicago, 2000 tons, and arrangements are being concluded for financing the Stevens Hotel, Chicago, requiring 1600 tons. Bar dealers are favored with an unusual quantity of small business, made up of tonnages below 100 tons. Billet steel reinforcing bars continue to be quoted at 2.60c., Chicago warehouse. Lettings include:

Municipal waterworks reservoir, Madison, Wis., 500 tons, to Truscon Steel Co.
North Park Hotel, Chicago, 500 tons of rail steel, to Inland Steel Co.
American Linen Co. plant, Chicago, 375 tons, to Concrete Engineering Co.
Friendly Building, Davenport, Iowa, 100 tons, to Olney J. Dean & Co.
DeWitt Clinton public school, Chicago, 150 tons of rail steel, to Olney J. Dean & Co.
Resurrection Academy, Chicago, 100 tons of rail steel, to Olney J. Dean & Co.
Guardian Angel home, Joliet, Ill., 200 tons, to American System of Reinforcing.
Kimberly-Clark Co., Neenah, Wis., addition to paper mill, 200 tons, to Kalman Steel Co.
Holy Cross Hospital, Merrill, Wis., 125 tons, to C. A. P. Turner Co.
Wisconsin State Fair Park, grandstand extension, 150 tons, to Kalman Steel Co.

Pending work includes:

South Park Commission, addition to Grant Park Stadium, 2000 tons, low bidder on general contract, John Griffiths & Son Co.
Portland Cement Association Building, Chicago, 125 tons.
High school building, Kankakee, Ill., 200 tons.
Singer Building, Chicago, 125 tons of rail steel.
Store and apartment building, Seventy-ninth Street and Cottage Grove Avenue, Chicago, 137 tons.
Florence Nightingale School, Chicago, 150 tons, Hanson Bros. low bidder on general contract.
Mason Street viaduct, Milwaukee, 700 tons, new general contract bids taken last week.

Old Material.—The market is extremely dull and prices are almost stationary. With the large mills out of the market and reducing their operations, one might expect still further weakness in quotations, but such is not the case. Yard dealers appear to be disposed to hold their scrap in the hope that they may profit by later advances. Outside of the steel works, the general run of consumers have very low scrap inventories. They are buying in a limited way, but significance is attached to the fact that they want quick shipment whenever they purchase a carload. Sellers have had

(Concluded on page 114)

New York

July Business Gives Fair Promise—Pig Iron Sold in Small Lots

NEW YORK, July 7.—It has been an exceedingly quiet week in pig iron, sales in the Metropolitan district being estimated at a total of 5000 to 6000 tons. Chiefly it is a small-lot business. Deliveries in most cases are for the third quarter and there is a fair sprinkling of prompt orders. Foundry output is apparently at the average rate of May and June and there has been some filling in business both in pig iron and coke. A number of sellers report transactions in special irons, indicating that some melters are running close on pig iron supplies and need to piece out for the maintenance of regular mixtures. The large buying of early June has not been renewed and none of the pending inquiries are for any considerable amount, though the prospect is for a continuation of good small-lot buying through July. While Buffalo iron has not figured in this district, one or two recent transactions in the New England district have been discussed with interest, in view of a price as low as \$18.25, Buffalo furnace, for No. 2 plain on a large lot. The blast furnace at Standish, N. Y., was blown in on July 1 and will make low phosphorus iron as heretofore.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	\$22.52 to \$22.77
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.02 to 23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.52 to 23.02
Buffalo, sil. 1.75 to 2.25	23.91
No. 2 Virginia, sil. 1.75 to 2.25	28.44

Ferroalloys.—Some substantial inquiries for ferromanganese are before the market for delivery in the last half, the total amounting to 2000 to 3000 tons, one calling for 1000 tons. Sales of at least 500 tons are reported in small lots at regular prices. Some consumers have been attempting to make purchases under established quotations, but so far have not succeeded as far as can be learned. There have been moderate sales of spiegeleisen, possibly about 500 tons. There is a fair amount of inquiry.

Finished Iron and Steel.—The five business days of July, up to and including today (Tuesday), have brought a fair volume of business to some of the steel companies, and there are indications that July tonnage will not fall far below the June rate. The Fourth of July holidays, however, brought somewhat of a lull in certain lines. In structural steel, for example, there has been a decided falling off in awards, but a large volume of work is being figured. The most important market development is the continued efforts of some of the mills to stabilize prices, particularly on sheets and cold rolled strip steel. Some sheet mills have quoted 4.20c. on galvanized and 3.15c. on black sheets and have obtained a few orders at these prices. While all of the larger mills appear to be on the higher price level, it is not yet certain that these prices are sufficiently general to become the market, but another week may tell. Blue annealed sheets are being sold at 2.25c. and 2.30c., Pittsburgh, with more mills holding out for the higher figure. It is said that cold rolled strip steel has been fairly well stabilized at 3.75c., Pittsburgh. One or two mills went to 4c., but this price is so far above the usual quotations that it is not expected to stick. Not much, if any, change has developed on plates, shapes and bars. Bars remain firm at 2c., while plates and shapes are about in the position of the past few weeks. Some plate mills will not go below 1.90c., Pittsburgh, but quotations of 1.80c. and 1.85c. are still being made

by at least one or two mills. Structural shapes remain at 1.90c. to 2c.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c.; plates, 2.14c. to 2.24c.; structural shapes, 2.24c. to 2.34c.

Warehouse Market.—Movement out of stock last week was not large, excepting structural steel and bars for which demand was strong. Sheets were again slow after the spurt of buying brought out by lower prices. There is still some price cutting and sheets have been taken at as low as 3.90c. base for black and 5.90c. base on galvanized. Pipe and spring steel were more active, but here again prices are being shaded. June was a good month both as to volume and prices obtained, although a little below May. Various prices are given on page 138, and we quote boiler tubes per 100 ft. as follows:

Lapwelded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Cast Iron Pipe.—Demand for bell and spigot pipe has thinned out to a small volume of fill-in orders, but prices continue firm and unchanged. The only tonnage of any size that is being looked forward to is 5000 to 6000 tons expected from the City of New York. The portion of the pipe tonnage purchased by Greenville, S. C., and awarded to the Standard Cast Iron Pipe & Foundry Co., was 6200 tons of 30 and 42-in., classes C and D. The soil pipe market is active, largely under the stimulus of the high discounts still being quoted by some makers, but like the market on bell and spigot pipe, the usual seasonal dullness has set in relatively early.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$59.60 to \$51.60; 4-in. and 5-in., \$55.60 to \$56.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 57½ to 60 per cent off list; heavy, 67½ to 70 per cent off list.

Old Material.—Prices are uneven on practically all grades, brokers' offerings depending largely upon their position with unfilled contracts. Conflicting views of the strength of the scrap market are in evidence among brokers and dealers, some claiming a firmer tendency to be developing, others maintaining that the market is still quiet and unchanged. No. 1 heavy melting steel is stable at \$15 per ton, delivered to eastern Pennsylvania consumers, this being the minimum buying price. One broker is offering \$15.50 to \$16 per ton, understood to be for shipment on a \$16.50 per ton order from a consumer taking a \$3.53 freight rate. Borings and turnings are still being purchased at \$12 to \$12.50 per ton, delivered, and machine shop turnings are being purchased at \$13 per ton, delivered Phoenixville. Cast borings are \$13.50 per ton, delivered to a Harrisburg consumer. Heavy breakable cast is firm at \$16, delivered to a Florence, N. J., consumer and \$16.50 per ton to Harrisburg. Stove plate and specification pipe are unchanged.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	\$10.25 to \$10.75
Heavy melting steel, railroad or equivalent	12.00 to 12.50
Rails for rolling	12.50 to 13.50
Relaying rails, nominal	22.00 to 23.00
Steel car axles	18.50 to 19.50
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	13.00 to 13.50
Forge fire	10.25 to 10.75
No. 1 yard wrought, long	12.00 to 12.50
Cast borings (steel mill)	9.25 to 9.75
Cast borings (chemical)	12.00 to 12.50
Machine shop turnings	9.00 to 9.50
Mixed borings and turnings	9.00 to 9.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate	10.00 to 11.50
Locomotive grate bars	10.50 to 11.00
Malleable cast (railroad)	13.50 to 14.50
Cast iron car wheels	13.00 to 13.50
No. 1 heavy breakable cast	12.25 to 13.25

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$16.50 to \$17.00
No. 1 heavy cast (columns, building material, etc.), cupola size	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	14.00 to 14.50

San Francisco

First Half Business Compared Well with Year Ago—Past Week Quiet

SAN FRANCISCO, July 3 (*By Air Mail*).—Business during the first half of this year compared favorably with the first six months of 1924 in the Pacific Coast iron and steel market. Estimates indicate that fabricated jobs from Jan. 1 to June 30 this year aggregated about 30,000 tons more than for the same period a year ago. In pig iron and coke the volume of business placed averaged about the same as last year, and this is probably true in respect to nearly all other lines.

Aside from slight price reductions by jobbers in sheets and wire nails out of stock, and the placing of a small volume of pending business, the past week brought few fresh developments. The San Joaquin Light & Power Co., Fresno, Cal., has placed 150 tons of drill steel with Ingersoll-Rand Co., for Swedish steel. A Southern California cement company is in the market for about 2000 tons of 10-in. line pipe, and the Shell Oil Co. has placed 130 tons of wire mesh for reinforcing a reservoir at Martinez, Cal. A small but unknown tonnage of Swedish steel was received here during the week, most of which, it is understood, was contracted for before arrival. Building permits issued from Jan. 1 to July 1, in this city, amounted to \$27,217,641, as compared with \$26,157,670 for the same period in 1924.

Pig Iron.—A Los Angeles interest is inquiring for 250 to 300 tons of malleable iron. The Southern Pacific Co. has not yet placed its inquiry for 500 tons of foundry. No new business has been developed. Prices are somewhat soft, and slightly lower quotations are understood to have been made in Utah iron, making the minimum now \$27, or 25c. below the last quotation. Foreign irons are quiet and prices are weak.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sil. 1.75 to 2.25	27.00 to 28.00
*English foundry	27.00 to 28.00
*Belgian foundry	26.00
*Dutch foundry	25.00
*Indian foundry	26.50
*German foundry	26.50
*Birmingham, Ala., foundry, sil. 2.75 to 3.25	29.00 to 30.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Prices are unchanged, 2.40c. to 2.45c., c.i.f. Coast ports. Lettings during the week were small, and no fresh inquiries have come into the market. Pacific Rolling Mill Co. is low bidder for the 800 tons required for the Mission High School, and the Central Iron Works took 145 tons for an apartment house on Ellis and Hyde Streets. Baker Iron Works is low bidder for the 900 tons involved in the Y. W. C. A. building in Los Angeles. Bids for the Crooked River bridge in Oregon calling for 350 tons have been thrown out and new bids are expected to be called shortly.

Plates.—The Southern Pacific Equipment Co. has called for bids for 3000 tons of plates and shapes, which will be used for building 500 box cars at Sacramento; bids close July 13. Oakland, Cal., has awarded a contract to the Pacific Coast Engineering Co. for steel pipe and ball joints for the requirements of the city during the ensuing year. The total tonnage required is unknown, but the minimum estimate is 125 tons. Steel Tank & Pipe Co. took 100 tons for four welded stills for the Shell Oil Co. The 550 tons required for two barges for the General Petroleum Co. has been canceled. Prices are weak but unchanged at 2.35c. to 2.40c., c.i.f. Coast ports. Some small contracts are understood to have been placed recently in Seattle, Wash., at less than 2.35c., but no verification of this has been obtained here.

Bars.—No lettings of 100-ton lots were made during the week in reinforcing bars, and no fresh inquiries for large quantities have been developed. The market is unusually quiet. Prices are unchanged. Local mills quote soft steel bars at 2.45c., f.o.b. San Francisco, in 100-ton lots, and 2.50c., base, per 100 lb. Reinforcing bars out of stock are as follows: 3.25c.,

base, 250 tons; 3.35c., base, carload; 3.50c. to 3.80c., base, l.c.l. Belgian bars are still quoted 1.80c. to 2c., c.i.f., duty paid, Coast ports.

Sheets.—The Superior Court has validated the contract awarded by the State Board of Control to the B. W. Norton Mfg. Co., Oakland, Cal., for 1,500,000 automobile license plates, and the 500 tons of one-pass black sheets required for the job has been placed with the Columbia Steel Corporation. A Los Angeles distributor has placed 900 tons of corrugated galvanized sheets and 100 tons of flat galvanized sheets with a local mill, instead of 750 tons, as reported a week ago. The Pacific Sheet Steel Corporation has been awarded about 500 tons of one-pass black sheets by the Kettle Mfg. Co. for Texas automobile license plates. Prices are somewhat firmer. The recent low quotations in galvanized sheets are no longer in the market. Most of the independent mills are now quoting 4.20c., Pittsburgh base, as a minimum. Blue annealed sheets are steady at 2.30c. to 2.40c., Pittsburgh base, and black sheets are holding at 3.15c. to 3.20c.

Warehouse Business.—Wire nails have been marked down 50c. base per 100 lb., and lower quotations are being made in sheets. Galvanized sheets were changed from \$6.25 per 100 lb. to \$5.75, blue annealed from \$4.20 to \$3.70, and black sheets from \$5.25 to \$4.65. Business during the week was somewhat quiet, but jobbers' records show that June sales were slightly ahead of May and, in most cases, better than June a year ago.

Merchant bars, \$3.30 base per 100 lb.; merchant bars, $\frac{3}{4}$ in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, $\frac{3}{4}$ in. and larger x $1\frac{1}{2}$ in. to $2\frac{3}{4}$ in., inc., \$3.30 base, per 100 lb.; channels and tees, $\frac{3}{4}$ in. to $2\frac{3}{4}$ in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.30 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates, $\frac{1}{4}$ in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, $\frac{1}{4}$ in. and thicker, \$6.30 base, per 100 lb.; wire nails, \$3.50 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$3.70 per 100 lb.; No. 28 galvanized sheets, \$5.75 per 100 lb.; No. 28 black sheets, \$4.65 per 100 lb.

Coke.—Interest is apathetic, as most buyers have filled their requirements. Importers have fairly good stocks in yard, and are able to make prompt deliveries. Prices are somewhat less firm, although no definite price change is known to have been made.

English beehive, \$14.50 to \$17 at incoming dock, and English by-product, \$12.50 to \$14; German by-product, \$14 to \$14.50; Birmingham, Ala., by-product, \$19 to \$20 delivered; Wise County, Va., beehive, \$22 delivered.

Old Material.—Mills are well supplied and the demand is on a hand-to-mouth basis. Prices continue weak.

Prices for scrap delivered to consumer's yards are as follows:

	Per Gross Ton
No. 1 heavy melting steel	\$10.50 to \$11.00
Scrap rails, miscellaneous	10.50 to 11.00
Rolled steel wheels	10.50 to 11.00
Couplers and knuckles	10.50 to 11.00
Mixed borings and turnings	6.00 to 6.50
Country mixed scrap	8.00 to 8.50
No. 1 cast scrap	22.00 to 24.00

Foundries Maintaining June Scale of Operations

DETROIT, July 7.—The holding up of shipments by one of the largest consumers of Detroit district scrap has caused a lull in the market on old material and impaired the strengthening tendencies noted the middle of last week. The melt in general is holding pretty close to June schedules and indications point to a good production in automotive lines through the third quarter.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	\$13.25 to \$13.75
Borings and short turnings	10.25 to 10.75
Long turnings	10.00 to 10.50
No. 1 machinery cast	15.00 to 16.00
Automobile cast	21.00 to 22.00
Hydraulic compressed	12.00 to 12.50
Stove plate	12.50 to 13.00
No. 1 bushing	12.00 to 12.50
Sheet clippings	8.75 to 9.25
Flashings	10.75 to 11.25

Buffalo

Sheets and Reinforcing Bars Active— Steel Maker Selling Foundry Iron

BUFFALO, July 6.—One local steel-making interest is becoming more active in pig iron business, and the past week booked considerable iron, though inquiry was small. The market is fairly firm at \$19, though a lower price is occasionally named. The smaller tonnages are allowed to go at standard prices but the appearance of a 1000-ton inquiry is the signal for hot competition. Total inquiry for the week was 5000 tons, with a 500-ton foundry inquiry and one for 300 tons of malleable included. Operations are as follows: Bethlehem-Lackawanna, four furnaces; Donner Steel Co., two; Rogers-Brown Iron Works, one; Hanna Furnace Co., two; Tonawanda Iron Corporation, one. One of the companies contemplates operating an additional stack, providing the price does not weaken further.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$18.75 to \$19.00
No. 2X foundry, sil. 2.25 to 2.75....	19.00 to 19.50
No. 1 foundry, sil. 2.75 to 3.25....	19.50 to 20.50
Malleable, sil. up to 2.25.....	19.00
Basic	18.50
Lake Superior charcoal	29.28

Finished Iron and Steel.—Considerable sheet booking has taken place in this district in the past two weeks. Outside mills have been active, naming a price of 3.15c., Pittsburgh, on most of the black sheet business. Larger users are pretty well covered, yet there seems to be a possibility of a stiffened price. Bars and shapes are firm at 2.265c. delivered Buffalo, but business placed shows little increase. Makers of reinforcing bars are cheered over recent bookings, demand having taken a sharp rise. One maker took 300 tons for an elevator addition and about 300 tons for roadwork. Two roadwork jobs of 100 tons each are pending and prices are firm. Warehouse business has improved, June records show, with the demand for sheets outstanding.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4c.; black wire, 4.05c.

Old Material.—The feature of the past week's market was the purchase by a Depew consumer of about 3000 tons of heavy melting steel at a price said to be \$17.50. Most of the heavy melting steel being sold today is going at \$16.50. A large Buffalo consumer has reduced its open-hearth capacity somewhat, on account of plant improvements going on, and is practically out of the market for a while. It has ordered shipments suspended. The result is an easing of the local situation, though some dealers are still short on orders for delivery at this plant. The consumer that has been in the market for stove plate continues to offer \$15.25, with offerings fair. The railroad lists closed with most of the scrap going to the Valley. Valley points are offering \$18 for heavy melting steel. The borings and turnings market is fairly active, with Cleveland buying mixed borings and turnings at \$13.25.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel.....	\$16.00 to \$16.50
Low phosphorus	18.50 to 19.50
No. 1 railroad wrought.....	14.00 to 14.50
Car wheels	16.00 to 16.50
Machine shop turnings	10.50 to 11.00
Cast iron borings	11.00 to 11.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.25
Grate bars.....	14.25 to 14.75
Bundled sheets	15.00 to 15.50
Hydraulic compressed	14.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	17.00 to 17.50
No. 1 cast scrap	16.50 to 17.00
Iron axles	26.00 to 27.00
Steel axles	17.00 to 17.50

Boston

Buffalo Pig Iron Offered at Concessions with Business Limited

BOSTON, July 7.—Buffalo steel mill interests are actively canvassing this territory for pig iron business, and are credited with having sold a fairly sizable tonnage for third quarter delivery during the past week or ten days. Sales are reported on a basis of \$18.50 at furnace for No. 2X and at \$18.75 for No. 1X, the usual 50c. a ton differential having been halved. On this basis No. 2 plain iron at the furnace would be \$18.25 a ton. Other Buffalo iron sold the past week at \$19 furnace base, with the regular differentials, or \$23.91 delivered, and more India iron has been sold on a delivered basis practically on a par with Buffalo. Some buying of Alabama iron continues, notwithstanding the disparity in prices for it and for Buffalo. Hardly enough eastern Pennsylvania and Virginia iron is available to constitute a market. Local receipts of foreign iron for the past week were 802 tons from India, against 4135 tons for the previous week from India.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$23.65 to \$24.65
East. Penn., sil. 2.25 to 2.75.....	24.15 to 25.15
Buffalo, sil. 1.75 to 2.25.....	23.16 to 23.91
Buffalo, sil. 2.25 to 2.75.....	23.41 to 24.41
Virginia, sil. 1.75 to 2.25.....	28.42 to 29.92
Virginia, sil. 2.25 to 2.75.....	28.92 to 30.42
Alabama, sil. 1.75 to 2.25.....	28.60
Alabama, sil. 2.25 to 2.75.....	29.10

Warehouse Business.—The movement of iron and steel and allied mill products is moderately large in the aggregate, but individual purchases are small. Competition is exceptionally keen. Cold rolled steel has been reduced \$4 a ton, to \$3.95 per 100 lb. from stock. Wire nails are 10c. a keg lower, at \$3.70 base, making a total cut of 20c. within a month. Galvanized barbed wire also is 10c. lower and a similar cut is noted in fence staples. Tire bolts are 10 per cent higher at 40 per cent discount.

Boston warehouse prices on iron and steel:

Steel, soft bars, \$3.26½ per 100 lb.; flats, \$4.15; concrete bars, \$3.26½ to \$3.54; structurals, angles and beams, \$3.36½; plates, ½-in. and heavier, \$3.36½; ¾-in., \$3.56½; tire steel, larger, \$4.50; smaller, \$4.75; open hearth spring steel, larger flats, \$5; smaller flats, also rounds and squares, \$10; crucible spring steel, \$12; cold rolled rounds, \$3.95; squares, hexagons and flats, \$4.45; toe calk steel, \$6. Iron, refined bars, \$3.26½ per 100 lb.; best refined bars, \$4.60; Wayne, \$5.50; Norway iron rounds, \$5.50; squares and flats, \$7.10.

Cast Iron Pipe.—The Warren Foundry & Pipe Co. is reported to have placed 500 tons of 24-in. pipe with Manchester, N. H. Newton, Mass., has taken bids on 200 tons of 6-in. pipe. Whatever other municipal business has been placed in this market recently was on private solicitation. A Connecticut city is about to come into the market for a substantial tonnage, but details are lacking. French pipe interests were obliged to buy fittings from a domestic pipe maker to complete an order for a New England municipality. Gas companies are still in the market for a fair volume of pipe. Prices quoted locally on domestic cast iron pipe follow: 4-in., \$60.10 a ton delivered common Boston rate points; 6-in. to 16-in., \$56.10; 20-in. and larger, \$55.10. The usual \$5 differential is asked on Class A and gas pipe.

Old Material.—A good demand for most kinds of scrap metal from the mills exists, but comparatively little material is coming on the market at going prices, consequently activity is more or less limited. Sellers are holding out for better prices, and are letting material go only when accumulation makes it necessary to do so. Current transactions are confined largely to materials suitable for steel mill use, New England consumers still being able to fill their requirements from local yards. Heavy melting steel appears pegged at \$11.50 to \$11.75 on cars, shipping point, for Pittsburgh district delivery. The market for eastern Pennsylvania deliveries is slightly lower. Contrasted with a week ago the market for this material is a shade firmer, and

bundled skeleton, especially long bundles, is fetching slightly higher prices. Otherwise, however, little variation is found in going prices.

The following prices are for gross ton lots delivered consuming points:

Textile cast	\$20.00 to \$20.50
No. 1 machinery cast	18.50 to 19.50
No. 2 machinery cast	15.50 to 16.50
Stove plates	13.00 to 13.50
Railroad malleable	19.00 to 20.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$11.50 to \$11.75
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long)	11.00 to 11.50
Machine shop turnings	8.50 to 8.75
Cast iron borings, chemical	11.00 to 11.50
Cast iron borings, rolling mill	8.50 to 8.75
Blast furnace borings and turnings	7.50 to 8.00
Forged scrap	9.50 to 10.00
Bundled skeleton, long	9.00 to 9.50
Bundled skeleton, short	9.50 to 10.00
Forged flashings	9.50 to 10.00
Shaftings	17.50 to 18.00
Street car axles	17.00 to 17.50
Rails for rerolling	12.50 to 13.00
Scrap rails	11.00 to 11.50

Cincinnati

Some Buying of Southern Iron—Signs of Price Firmness

CINCINNATI, July 7.—Restricted activities characterized the local pig iron market, even though sales have increased slightly. Bookings in the past week totaled 3000 tons and, for the first time in many months, Southern furnaces received the major portion of the business. Alabama iron has been moving more freely into this territory. A local melter has taken 500 tons, while several Indiana and Ohio consumers have placed orders aggregating 350 tons. Some of these sales have been made as low as \$18, Birmingham, but others have brought \$19. One Alabama furnace is still asking \$20.50, Birmingham. The Louisville & Nashville Railroad has closed for approximately 550 tons of Southern charcoal and foundry iron. No change has been noted in the prevailing price of \$19, furnace, on Northern iron in the Ironton district. However, Ironton furnaces are not desirous of booking large tonnages at this figure and they are quoting \$19.50. Indications are that this price will slowly gain strength in the next few weeks. Movement of malleable iron has been better and has included 500 tons to a Springfield, Ohio, melter. Sales of Northern foundry have been limited to single carloads. Tennessee iron has been quiet at \$17.50, Birmingham. The silvery market is showing more life. Sale of 300 tons of silvery to an Indiana melter is noted. One Jackson County silvery furnace has issued a new price schedule with 6 per cent listed at \$24 and 8 per cent at \$26. The schedule likewise shows a reduction on various grades of Bessemer ferrosilicon ranging from \$1.50 to \$2. Inquiries for pig iron are confined to carloads.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$22.05 to \$24.55
Alabama fdy., sil. 2.25 to 2.75	22.55 to 25.05
Tennessee fdy., sil. 1.75 to 2.25	21.55
Southern Ohio silvery, 8 per cent	28.27
Southern Ohio fdy., sil. 1.75 to 2.25	21.27 to 21.77
Southern Ohio, basic (nominal)	22.27
Southern Ohio, malleable	22.27

Bars, Shapes and Plates.—Several sellers report increased movement of bars, but others state that little demand is being evidenced. Orders are individually small, but numerous. Buyers are specifying delivery within several weeks and apparently no interest is manifested in requirements beyond this month. The price of bars is settling to 2c., Pittsburgh, on small as well as large tonnages. Weakness has cropped out in plates. One buyer has placed an attractive order at 1.90c., Pittsburgh, but sellers are exerting much effort to prevent the market on plates from falling to this level. Eastern mills are holding in most cases to 2c., Pitts-

burgh. The Big Four Railroad is inquiring for 800 tons of plates; bids close on July 14. Shapes are selling at 2c., Pittsburgh, but demand is quiet. Structural activities are dull. The Dayton, Ohio, Masonic Temple, calling for 1500 tons of steel, is the only large job pending.

Sheets.—Orders are confined to small lots for delivery within thirty days. Indications point to a continuation of hand-to-mouth buying in the immediate future. Mills in this territory are reported to be operating at about 80 per cent of capacity, but they are dependent upon current bookings for maintenance of present operating schedules. Prices on black sheets have been soft. Most mills are selling at 3.15c., Pittsburgh, although several Eastern interests refuse to go below 3.20c. Galvanized sheets are in fair demand at 4.15c. to 4.20c., Pittsburgh. Prices on blue annealed vary from 2.25c. to 2.30c., Pittsburgh, which is a slight drop from last week's quotations. Several mills are fairly busy on auto sheets, but the demand in this territory is scant. Prices are 4.20c. to 4.25c., Pittsburgh.

Wire Goods.—Solicitation of orders by mills in the Ironton district has brought out low prices. Eastern sellers of nails are holding to 2.65c., Pittsburgh or Cleveland, which is not sufficiently low to compete with the Ironton price of 2.60c., mill. Ironton sellers are giving customers the benefit of the water rate to Cincinnati, which results in a quotation of 2.74c., delivered in Cincinnati. It is reported that some of the business booked on this basis has been shipped by rail, the seller absorbing the loss. Pittsburgh mills are asking 2.50c., Pittsburgh or Cleveland, on plain wire, while producers in the Ironton district are taking orders at 2.45c., Ironton. Eastern sellers, in trying to prevent the further downward trend of nails and wire, have not been successful. The Big Four Railroad is inquiring for 200,000 galvanized tie dating nails.

Reinforcing Bars.—The Blagg Co., Dayton, Ohio, which has been awarded the general contract for the Dayton Masonic Temple, will buy 250 tons of bars. Requirements for the electrical building at the University of Cincinnati and for the Sacred Heart School, totaling 420 tons, will be placed in the next ten days. Bids have gone in to C. F. Stegner, architect, Second National Bank Building, Cincinnati, for 900 tons for the new warehouse of the Kroger Grocery & Baking Co. at Cleveland. Numerous inquiries are out for small tonnages. Sellers believe that the local market will be fairly active throughout July. New billet bars are quoted at 2c. to 2.10c., mill. Rail steel bars are selling at 1.90c. to 1.95c., mill.

Warehouse Business.—July has opened with fairly good sales by a number of local jobbers. It is anticipated that orders this month will fall off to some extent, due to the usual midsummer dullness, but business is not expected to go far below the June volume. Competition between several jobbing houses involved in a price war on nails has been severe, but has not brought out any quotations lower than \$2.95 per base keg. Demand for structural steel has decreased markedly in the last few weeks. A fair volume of reinforcing bars is moving from warehouses at 3.30c. Sales of cold-rolled products have been quiet. Interest in tubular goods continues and jobbers have booked some nice orders.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.70c.; squares, 4.20c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire, \$3.00 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.40 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Coke.—Specifications for foundry coke are about on a par with those during June. By-product coke producers have been shipping considerable tonnage to Michigan consumers. Movement of furnace coke is sluggish, due to curtailed blast furnace operations in this territory. Quotations remain unchanged. Little inquiry has been made by consumers.

Old Material.—Activities are limited to trading among dealers. Mill purchases are at a minimum and little inquiry has developed. Dealers are holding stocks in anticipation of better prices within the next month. The Norfolk & Western Railroad has 4500 tons on its monthly list, which closes on July 17 and 2400 tons on a supplementary list from its Portsmouth, Ohio, yards, which closes on July 10. Local dealers were successful bidders on some of the material offered by the Big Four Railroad last week. Prices are unchanged.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	\$14.00 to \$14.50
Scrap rails for melting	14.00 to 14.50
Short rails	18.00 to 18.50
Relaying rails	28.00 to 28.50
Rails for rolling	15.50 to 16.00
Old car wheels	14.50 to 15.00
No. 1 locomotive tires	17.50 to 18.00
Railroad malleable	16.50 to 17.00
Agricultural malleable	15.50 to 16.00
Loose sheet clippings	10.00 to 10.50
Champion bundled sheets	12.00 to 12.50
Per Net Ton	
Cast iron borings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	16.00 to 16.50
Iron axles	22.50 to 23.00
No. 1 railroad wrought	11.50 to 12.00
Pipes and flues	9.00 to 10.00
No. 1 busheling	10.50 to 11.00
Mixed busheling	9.50 to 10.00
Barnt cast	10.00 to 10.50
Stove plate	10.50 to 11.00
Brake shoes	10.50 to 11.00

St. Louis

Pig Iron Business Stagnant—Few Structural Contracts Offering

ST. LOUIS, July 6.—The third quarter of the year opened with almost no pig iron business being placed. Consumers in the district, curtailing operations for repairs and other purposes, are showing no interest in their future requirements for raw material. Makers expect a revival of buying soon. The St. Louis Coke & Iron Co. sold only about 750 tons during the week, in lots of one and two carloads. The only inquiries of consequence are 3000 tons for an upper Illinois melter and 500 tons for a Southern railroad. Quotations are nominal, and there is not enough business offered to test the market. The proposed freight rate of \$4.42 per ton on pig iron from Birmingham to St. Louis territory, which was to have gone into effect on July 7, to supplant the present rate of \$5.17, has been suspended until Nov. 3.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$5.17 from Birmingham, all rail, and \$1c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	\$22.66
Northern malleable, sil. 1.75 to 2.25	22.66
Basic	22.66
Alabama fdy., sil. 1.75 to 2.25	22.67
(rail)	22.67
Tennessee fdy., sil. 1.75 to 2.25	22.67
Granite City iron, sil. 1.75 to 2.25	21.31 to 21.81

Finished Iron and Steel.—Manufacturers of steel products continue to buy only in small lots, to take care of their immediate requirements, and these represent only a fair volume. Railroad inquiries also are small. No new structural jobs, other than those previously mentioned in THE IRON AGE, are pending. The Missouri Highway Commission has let road and bridge contracts which will require about 650 tons of reinforcing bars.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.50c.; galvanized sheets, No. 28, 5.50c.; black corrugated sheets, 4.65c.; galvanized, 5.65c.; cold-rolled rounds, shafting and screw stock, 3.70c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{2}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Coke.—The St. Louis Coke & Iron Co. reports additional foundry coke contracts during the week totaling 2000 to 3000 tons, for delivery throughout the remainder of the year. One smelting concern in the district bought 600 tons of furnace coke. Very little Connellsville coke is being shipped into this market.

Old Material.—The market for old material is more quiet than last week. Consumers not only are not interested in making purchases, but dealers are receiving requests to delay shipments of old material on contracts. Dealers have faith in the market and are paying what some consider more than the material is worth. New railroad lists include: Chicago, Milwaukee & St. Paul, 3000 tons; Mobile & Ohio, 700 tons, and Missouri Pacific, 2500 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$14.00 to \$14.50
Rails for rolling	17.50 to 18.00
Steel rails less than 3 ft.	18.00 to 18.50
Relaying rails, 60 lb. and under	24.00 to 25.00
Relaying rails, 70 lb. and over	30.00 to 30.50
Cast iron car wheels	17.50 to 18.00
Heavy melting steel	14.50 to 15.00
Heavy shoveling steel	14.50 to 15.00
Frogs, switches and guards cut apart	16.50 to 17.00
Railroad springs	18.00 to 18.50
Heavy axles and tire turnings	11.50 to 12.00
No. 1 locomotive tires	16.50 to 17.00
Per Net Ton	
Steel angle bars	15.00 to 15.50
Steel car axles	18.00 to 18.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	19.00 to 19.50
No. 1 railroad wrought	13.25 to 13.75
No. 2 railroad wrought	13.00 to 13.50
Cast iron borings	10.00 to 10.50
No. 1 busheling	11.50 to 12.00
No. 1 railroad cast	16.50 to 17.00
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	13.75 to 14.25
Machine shop turnings	8.00 to 8.50
Champion bundled sheets	9.00 to 9.50

Canadian Scrap Market Stagnant—Steel Mills Curtailing

TORONTO, Ont., July 7.—The Canadian iron and steel scrap market has again reverted to a state bordering on stagnation, with melters showing only passing interest in requirements, either for spot or future delivery. So far only one or two of the larger consumers have come forward with third quarter contracts, the remainder being content to buy scrap on a hand-to-mouth basis.

Steel mills which have been busy since the beginning of March are now beginning to curtail operations. The Algoma Steel Corporation, Sault Ste. Marie, Ont., has closed down its rail mill, and cut operations in some other departments. The British Empire Steel Corporation has closed down the greater part of its plant at Sydney, N. S., and at present only one blast furnace is blowing and the wire and nail departments have gone onto a four-day-a-week basis. Foundries have shown no change in operations, but continue at between 40 and 60 per cent.

Iron and steel interests in this country can see no signs of an immediate change for the better, and it is now predicted that the business for the last half of this year will be much below that of the first six months. Only a limited amount of business is reported in the scrap market on export account. No change is reported in dealers' buying prices, which are as follows:

Gross Tons		
	Toronto	Montreal
Steel turnings	\$9.50	\$9.00
Machine shop turnings	9.50	9.00
Wrought pipe	7.00	7.00
Rails	11.00	12.00
No. 1 wrought scrap	12.00	14.00
Heavy melting steel	11.00	11.00
Steel axles	17.00	18.00
Axles, wrought iron	19.00	20.00
Net Tons		
Standard car wheels	15.00	15.00
Malleable scrap	13.00	15.00
Stove plate	13.00	13.00
No. 1 machinery cast	17.00	16.00

Cleveland

Price Firmness in Steel Developing— Pig Iron Quiet

CLEVELAND, July 7.—A moderate demand is keeping up for steel but buying is mostly in small lots for early requirements. Not much additional business has come out in third quarter contracts. The demand for pipe continues fairly heavy. Orders for good sized lots of steel bars are coming from makers of screw stock. The automotive industry continues to specify freely and is taking about as much steel as last month. Firmness has developed in the sheet and cold rolled strip market as a result of the efforts of makers to get better prices. The market is stiff at 2c. for steel bars and structural material and 1.90c. for plates with apparently little effort on the part of buyers to secure concessions. In addition to other Lake boats pending, an inquiry has come from the Canadian National Railways for two barges requiring 6000 tons of steel. Other new inquiries include one from the Standard Oil Co. of New Jersey for stills requiring 900 tons of plates. The structural market has taken on a little more life but some of the fabricating shops need work and extremely low prices are being quoted on fabricated material.

Iron Ore.—A Pittsburgh district consumer has closed for its ore requirements amounting to over 100,000 tons, the most of this going to two Cleveland interests. Other sales during the week included three lots of low grade ore aggregating 24,000 tons. The movement by water last month was 7,958,486 tons as compared with 8,313,984 tons in May and with 7,583,926 tons in June last year. Shipments until July 1 were 18,393,185 tons, a gain of 3,566,057 tons or 24 per cent over the corresponding period last year. Ore men expect that the shipments for the season will amount to 50,000,000 tons.

Pig Iron.—The buying movement has tapered down to the extent that the market has become rather dull after two months of activity during which most consumers covered for the third quarter and many for the last half. Quite a number of sales were made during the week, two interests booking 5000 tons each in foundry and malleable grades. A large share of the buying was in Michigan and Indiana. One producer sold three 1000 ton lots to foundries in western Ohio, Indiana and Michigan. Other sales were in rather small lots. Prices are holding to recent quotations and there is little, if any, effort to secure any higher prices. The prevailing quotations on foundry and malleable iron in points served by Lake furnaces out of reach of Valley furnace competition is \$19, but Valley furnaces are still on a \$18.50 basis. In Cleveland the market is firm at \$19.50 furnace for local delivery. No activity is reported in any grades outside of foundry and malleable. Furnaces have received good July shipping orders on contracts. The automotive industry still is taking a large tonnage of iron. The Stewart Furnace Co. will blow out its furnace at Sharon, Pa., this week.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 from Birmingham:

Basic, Valley furnace.....	\$18.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	20.00
Southern fdy., sil. 1.75 to 2.25.....	\$24.50 to 26.01
Malleable	20.00
Ohio silvery, 8 per cent.....	29.02
Standard low phos., Valley furnace.....	25.00

Semi-Finished Steel.—It seems probable that sheet bars will remain at \$35, Youngstown, for the third quarter, as efforts to secure concessions from that price have proved unsuccessful. Small lots have been made at \$35 and some contracts basing the price on trade paper quotations have been extended into the third quarter and specifications issued against these contracts. Billet and slab prices are untested.

Sheets.—The market shows more strength than for some time as a result of the refusal of several of the independent mills to meet the lower prices that have been appearing. Most producers are now holding to 3.15c. for black sheets, although 3.10c. apparently has not disappeared for attractive business. Other grades now appear firm at 2.30c. for blue annealed, 4.20c. for galvanized and 4.25c. for auto body sheets. The demand is fair.

Cold Rolled Strip Steel.—The efforts of manufacturers to get better prices for their product have resulted in the stiffening of the cold rolled strip steel market and 3.75c. is now the usual quotation or \$5 a ton above the price that recently has been common.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues fair but is mostly in specifications on contracts. Prices are firm. A local maker is still holding to \$2.60 for large rivets, although \$2.50 is rather commonly quoted. Small rivets continue weak. Small lot sales are being made at 70 and 10 per cent off list, but large orders are bringing out an additional 10 per cent discount.

Reinforcing Bars.—Considerable new work is coming out. A factory building for the Hudson Motor Car Co., Detroit, will require 1050 tons and other new inquiries include 350 tons for a building for the Firestone Tire & Rubber Co., Akron; 400 tons for footings for an exchange building in Cleveland for the Ohio Bell Telephone Co. and 150 tons for the Allerton Hotel, Cleveland. The Bourne-Fuller Co. has taken 125 tons for bridge work for the Nickel Plate Railroad at Old Fort, Ohio. Rail steel bars are quoted at 1.80c., but this price might be shaded \$1 a ton on a round lot.

Coke.—Sales of foundry coke are light as most consumers are under third quarter contracts. Prices are unchanged at \$4 to \$4.50 for standard brands of Conneville foundry coke and \$6.50 Fairport for Ohio by-product coke.

Old Material.—There is some demand for blast furnace scrap from dealers who still have short orders and activity in these grades has caused a price advance of about 50c. a ton. Other grades are inactive. Scrap is not moving in very good volume as some consumers are holding back on shipments. Offerings are somewhat more plentiful than they have been, but selling pressure is lacking and weakness is not in evidence. Heavy melting steel is being freely offered at \$15.75 for Cleveland delivery.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$15.25 to \$15.50
Rails for rolling.....	15.00 to 15.50
Rails under 3 ft.....	18.50 to 19.00
Low phosphorus melting.....	17.00 to 17.25
Cast iron borings.....	13.00 to 13.25
Machine shop turnings.....	12.75 to 13.00
Mixed borings and short turnings.....	13.00 to 13.25
Compressed sheet steel.....	13.25 to 13.50
Railroad wrought	12.00 to 12.25
Railroad malleable	17.75 to 18.00
Light bundled sheet stampings.....	11.00 to 11.50
Steel axle turnings.....	14.25 to 14.50
No. 1 cast.....	17.75 to 18.00
No. 1 busheling.....	12.50 to 13.00
Drop forge flashings.....	11.75 to 12.00
Railroad grate bars.....	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues.....	9.00 to 9.25

An extension to its main foundry building will increase the size of the cleaning room and shipping platform of the Chicago Steel Foundry Co., Kedzie Avenue and Thirty-seventh Street, Chicago, which is also installing a 10-ton capacity, double chamber, electric annealing furnace built by the Electric Furnace Co., Salem, Ohio.

Two blast furnaces of the Carnegie Steel Co. are to be rebuilt by the William B. Pollock Co., one at the Ohio Works, Youngstown, and the other at Mingo Junction, Ohio.

Birmingham

Cast Iron Pipe Plants and Fabricating Shops Busy—Scrap Lower

BIRMINGHAM, July 6.—There has been a little decrease in output, one blast furnace going out for repairs. Quotations are now at \$18.50 to \$19, and reports are current that these prices are being cut. The larger melters are still inquiring for iron. Soil pipe and fittings are not in strong demand, and two local shops have been added recently to the number either down altogether or nearly so. A few sales of iron for delivery during the fourth quarter do not warrant assertion that a pace is being set for that period. Some furnace interests are not willing to sell into the fourth quarter at present quotations. Tennessee furnaces are selling under Birmingham quotations, but a difference in the iron is pointed out, Birmingham iron not being so high in phosphorus. Differentials in freight are also noted on iron moving via river from Sheffield-Florence, Ala., to points in Middle West. Some disappointment is felt by Southern furnace companies on delay in readjustment of freight rates into certain points of Middle West.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	\$18.00 to \$19.00
No. 1 foundry, 2.25 to 2.75 sil.	19.00 to 19.50
Basic	18.50 to 19.50
Charcoal, warm blast	32.00

Cast Iron Pipe.—Several specifications have been bid on by Southern cast iron pressure pipe manufacturers lately and some few lettings were received the past week. Competition of French pipe is not complained of to any great extent. Quotations continue on a \$40 per ton base for 6-in. and over pipe, with claims of sales at \$39 and even lower.

Finished Steel.—Steel fabricating plants in the Birmingham district are still working busily on orders for varied lots, structural, reinforced concrete steel bars and other shapes for Florida consumption. Steel Corporation plants in this district are still operating to near capacity and the Gulf States Steel Co. for upward of 70 per cent. The new sheet mill of the Tennessee company and the steel plate fabricating plant of Reeves Brothers, Inc., will be in operation by the end of the month. Soft steel bars are quoted in Birmingham at 2.15c. to 2.25c.

Coke.—Independent coke producers here, through persistent efforts, are selling their output. The make has been slightly reduced. Foundry coke is selling at \$4.50 and up to \$5, in small quantities.

Old Material.—Quotations are weak and several reductions noted in iron and steel scrap. Heavy melting steel is holding \$13 as base price. Dealers are carrying good stocks and confident of better conditions soon.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	13.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
Steel rails	13.00 to 14.00
No. 1 cast	16.00 to 16.50
Tramcar wheels	16.50 to 17.00
Car wheels	15.00 to 16.00
Stove plate	13.00 to 13.50
Machine shop turnings	7.00 to 8.00
Cast iron borings	7.00 to 8.00
Rails for rolling	16.50 to 17.00

Roll designs for a number of small and intermediate sized structural shapes have been supplied the Manitoba Rolling Mill Co., Selkirk, Manitoba, by Albert W. Heinle, consulting metal rolling engineer, Pittsburgh. The company is adding several new shapes to its present range, including rerolled rail.

Building permits in 365 comparable cities are reported by S. W. Straus & Co. to have amounted in May to \$393,923,451, compared with \$459,684,851 in April. For May, 1924, these cities showed \$340,124,492.

Philadelphia

Possibility of Anthracite Coal Strike Excites Attention in Pig Iron Trade

PHILADELPHIA, July 7.—Efforts of some buyers of pig iron to cover for fourth quarter have directed the attention of the pig iron trade to the possible effects upon coke and pig iron prices of a suspension in the anthracite coal mining fields on Aug. 31. If the strike should create a larger demand for bituminous coal, it would result in higher coke prices and pig iron prices might also be affected. Although this is still within the realm of surmise, pig iron producers are questioning whether they should take on business for fourth quarter. Some has already been booked for all of first half, but little has been sold specifically for fourth quarter. As yet the pig iron market has taken on no strength because of expected developments in the coal fields.

The steel situation looks fairly promising for July. There were shut-downs last week at some mills, but a few mills suspended operations only on Saturday and Sunday. Orders have come in at a fairly good rate during the first few days of July and nothing has developed to indicate any marked change from the June rate of steel consumption. Some of the warehouses are laying in a little stock and there are also signs that certain large consumers are watching the price situation more closely, especially in view of the firm stand on prices taken by some of the sheet mills and makers of cold rolled strips. Some plate mills also are resisting efforts to force the market below 1.90c., Pittsburgh, and so far they have been fairly successful.

Pig Iron.—Two companies made substantial purchases of pig iron within the past week, but otherwise the market has been very quiet. A cast iron pipe company bought 10,000 to 15,000 tons of what is now designated as "pipe iron" and most of this will be barged up the Delaware River from two furnaces. Not over \$20, delivered, was paid for this iron. The other purchaser was a wire company, which bought 5000 tons of domestic low phosphorus iron. Furnace operators are considering the possible effects of the threatened anthracite coal strike upon coke and pig iron prices and it is likely that they will go a little slow in selling for fourth quarter. Some inquiry for that period has appeared lately. The price situation shows little change. It is true that \$20.50, base, has become more general on foundry iron, but there is no certainty that the market has become definitely established at that figure. The range is more likely \$20 to \$20.50, with the lower price open only to those who have attractive orders to place. On contracts running over the next few months sellers generally insist on \$20.50, furnace, for No. 2 plain and \$21 for No. 2 X. The fact that good grades of foreign iron are being offered at \$20 to \$20.50, c.i.f. Philadelphia, prevents eastern Pennsylvania furnaces from getting above \$20.50 at this time. Several lots of foreign iron, aggregating possibly a thousand tons or more, are in storage in Philadelphia and as warehouse charges mount rapidly there is some pressure to sell this iron. Some of it will stand the owners a loss at today's prices.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$20.76 to \$21.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 22.13
East. Pa. No. 1X	21.76 to 22.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.67 to 29.17
Virginia No. 2X, 2.25 to 2.75 sil.	29.17 to 29.67
Basic delivery eastern Pa.	21.50 to 22.00
Gray forge	21.50 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 25.50

Ferroalloys.—Demand for ferromanganese is for small lots and the price remains unchanged at \$115, seaboard or furnace.

Billets.—There is not enough demand to test billet prices, which nominally stand at \$35 for rerolling quality and \$40 for forging quality, Pittsburgh basis.

Plates.—An interesting situation in the plate market is that most of the sales are being made at 1.90c., Pittsburgh, although some transactions have brought out prices of 1.85c. and 1.80c. These latter prices, however, are exceptional and most of the mills will not quote below 1.90c. A fair volume of business is being done and July operations started out at about the rate that has been maintained in recent weeks. The Reading Railroad is inquiring for 1000 to 1500 tons of plates.

Structural Material.—Although the price of structural shapes has occasionally dipped below 1.90c., Pittsburgh, most of the current business is being done at 1.90c. and 2c., Pittsburgh. Whenever anything below 1.90c. has developed it has been on unusually attractive tonnage. Some mills will not go below 1.90c. no matter how attractive the tonnage is.

Bars.—Steel bars continue firm at 2c., Pittsburgh. No deviations from this price are reported, the strength of bars being now so well taken for granted by buyers that few efforts are being made to beat that price. Bar iron is still quoted at 2.22c., Philadelphia.

Warehouse Business.—Keen competition among local warehouses has resulted in a revision of prices downward on some products. We quote for local delivery as follows:

Soft steel bars and small shapes, 2.90c.; iron bars (except bands), 2.90c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 2.90c.; tank steel plates, ½ in., 3.05c. to 3.10c.; blue annealed steel sheets, No. 10 gage, 3.35c.; black sheets, No. 28 gage, 4.35c.; galvanized sheets, No. 28 gage, 5.45c.; square, twisted and deformed steel bars, 2.85c.; structural shapes, 2.80c.; diamond pattern plates, ¼ in., 5.30c.; ½ in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4c.; squares and flats, cold-rolled steel, 4.50c.; steel hoops, 4c. base; steel bands, No. 12 gage to ½ in., inclusive, 3.75c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Old Material.—The scrap market has struck a period of waiting. Prices are neither advancing nor declining, but the tendency is toward firmness. Some in the scrap trade hold that the fundamental strength of the market is shown by the fact that prices are holding steady now at a season when ordinarily price declines are in order as mid-summer has seldom been a time of strength in the scrap market. Mills in this district are freely offering \$15.50 and \$16, delivered, for No. 1 heavy melting steel but brokers and dealers are willing to take on only small tonnages at these prices.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel.....	\$15.50 to \$16.50
Scrap rails	15.50 to 16.50
Steel rails for rolling.....	17.50 to 18.00
No. 1 low phos. heavy 0.04 and under	20.50 to 21.50
Couplers and knuckles.....	20.00 to 20.50
Rolled steel wheels.....	20.00 to 20.50
Cast iron car wheels.....	17.00 to 17.50
No. 1 railroad wrought.....	18.00 to 18.50
No. 1 yard wrought.....	17.00 to 17.50
No. 1 forge fire.....	14.50 to 15.00
Bundled sheets (for steel works)	13.50
Mixed borings and turnings (for blast furnace use).....	12.00 to 13.00
Machine shop turnings (for steel works use)	13.50
Machine shop turnings (for rolling mill use).....	13.50 to 14.00
Heavy axle turnings (or equivalent)	14.50 to 15.50
Cast borings (for steel works and rolling mill).....	14.00
Cast borings (for chemical plant)	15.50 to 16.00
No. 1 cast.....	17.50 to 18.00
Heavy breakable cast (for steel plants)	17.00
Railroad grate bars.....	14.00
Stove plate (for steel plant use)	14.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.50
Shafting	23.00 to 24.00
Steel axles	23.00 to 24.00

Sheets.—Efforts of sheet manufacturers to advance prices will be watched with interest by buyers and sellers alike. Most of the larger makers of sheets are quoting 4.20c. on galvanized and 3.15c. on black, but

they are not yet sure that the entire sheet trade is on this basis. All mills, however, are said to have been losing money at recent selling prices and some in the trade confidently expect that there will be a general movement to the new price level. Blue annealed sheets are unchanged, being quoted at 2.25c. and 2.30c., with the tendency toward the higher figure.

Imports.—Pig iron is now coming in in smaller lots, last week's imports being as follows: From the Netherlands, 200 tons; Sweden, 101 tons; India, 856 tons; Belgium, 10 tons. Iron ore imports were 7300 tons from Spain and 7858 tons from Sweden, while 3500 tons of manganese ore came from Brazil. Steel imports were small, 375 tons of structural steel from Belgium, 29 tons of blooms from Strassbourg and 10 tons of billets from Sweden being the only items.

RAILROAD EQUIPMENT

Pennsylvania Orders Passenger Equipment—Central of Georgia Wants 1000 Cars

Freight cars in need of repair on June 15 totaled 201,243 or 8.7 per cent of the number on line, according to the Car Service Division, American Railway Association. This was an increase of 5257 over the number reported as of June 1. Class 1 railroads on June 15 had 11,851 locomotives in need of repair, 18.2 per cent of the number on line. This was an increase of 749 over June 1.

The Department of Commerce, Washington, reports that June shipments of railroad locomotives totaled 110 locomotives as compared with 96 in May and 145 in June, 1924. The total shipped in the first half of the year was 582, including 160 for export, as compared with 711 in the first half of 1924 and 1405 in the first half of 1923.

The Pennsylvania Railroad has placed orders for 367 passenger, baggage and mail cars. The American Car & Foundry Co. will build 122 all-steel baggage cars and 12 steel passenger and baggage. The Pressed Steel Car Co. was awarded orders for 80 baggage and 10 baggage and mail. The Standard Steel Car Co. will build 70 coaches and the Pullman Car & Mfg. Corporation was awarded 35 coaches and 5 passenger-baggage-mail combination cars. The remaining cars were distributed to other companies, it being reported in New York that the St. Louis Car Co. got 20 baggage.

The Central Railroad of Georgia has issued an inquiry for 1000 freight cars of two or three types.

The Chicago, Wilmington & Franklin Coal Co. has ordered 20 hand push cars from the American Car & Foundry Co.

The Great Northern has placed 100 additional underframes with the Siems-Stemmel Co.

The Southern Pacific Equipment Co., a subsidiary of the Southern Pacific Co., is in the market for 1000 to 2000 tons of steel for car repairs.

Comparison of transportation costs by railroad and by way of the New York State barge canal is covered in a 16-page pamphlet issued by the Bureau of Railway Economics, Washington. The summary shows that the barge canal, up to June 30, 1923, represented a capital investment of \$230,881,014, and that the cost of the tonnage moved on the canal in that year was 3.481c. per ton-mile. This compares with 1.104c. per ton-mile, the average freight receipts for the same year on the railroad lines of the Eastern district of the United States.

Economic factors in the railroad situation are discussed in a 14-page pamphlet (No. 296) by the Bureau of Railway Economics, Washington. Class I railroads from 1914 to 1924 are shown to have increased the net freight ton-miles by 36.8 per cent, average load per freight train by 39.6 per cent and the volume of passenger traffic by 4.5 per cent. That the trains were much heavier is shown by the concurrent reduction in freight train-miles of 2.1 per cent, and in passenger train-miles of 5.8 per cent. Average receipts per ton-mile reached a peak at 1.275c. in 1921 and since have fallen to 1.116c.

FABRICATED STEEL

Awards Only 12,500 Tons in Holiday Week, and Inquiries Also Show Falling Off

Fourth of July holidays undoubtedly accounted for the large falling off in structural steel work placed in the past week. Awards, as reported to THE IRON AGE, totaled less than 12,500 tons, the lowest record in many weeks. Inquiries were also smaller in the aggregate, totaling only 17,600 tons. Awards were mostly small jobs, there being none of outstanding size. The Erie Railroad has put out the largest inquiry of the week, one for 7700 tons for a pier on the Hudson River. Bookings were in part as follows:

School, Radnor, Pa., 270 tons, to McClintic-Marshall Co.
Reading Railroad, bridge, 260 tons, to Bethlehem Steel Corporation.

Pennsylvania Railroad, bridge, 100 tons, to Bethlehem Steel Corporation.

Street lighting plant, Jamestown, N. Y., addition, 150 tons, to Rogers Structural Steel Co.

Apartment building, West Seventy-seventh Street, New York, 350 tons, to Paterson Bridge Co.

Real Estate Board of New York, office building, West Forty-first Street, New York, 1200 tons, to Hedden Iron Construction Co.

Public School No. 42, Borough of Richmond, New York, 350 tons, to Hedden Iron Construction Co.

Chesapeake & Ohio Railroad, bridge, 200 tons, to American Bridge Co.

Highway bridge, Hackensack, N. J., 1300 tons, to American Bridge Co.

Theater, Atlantic City, N. J., 350 tons, to New York Shipbuilding Corporation.

Westinghouse Electric & Mfg. Co., Linhart, Pa., brass foundry, 800 tons, to American Bridge Co.

John Harris High School, Harrisburg, Pa., 500 tons, to Jones & Laughlin Steel Corporation.

Bessemer Gas Engine Co., Grove City, Pa., extension, 400 tons, to Jones & Laughlin Steel Corporation.

Nashville, Chattanooga & St. Louis Railroad, five bridges, 100 tons, to McClintic-Marshall Co.

Phoenix Stone Co., mill building, 160 tons, to Virginia Bridge Co.

Crooks-Dittmar Co., Williamsport, Pa., factory, 200 tons, to Rogers Structural Steel Co.

Rice Hotel Annex, Houston, Tex., 1292 tons, to Pennsylvania Car Co.

Castile Mining Co., headframe and idler stands, Ramsay, Mich., 536 tons.

Stephens-Adamson Mfg. Co., Aurora, Ill., branch plant at Detroit, 410 tons, to unnamed fabricator.

Rock Island Lines, bridge over Illinois Central tracks, Burnside, Chicago, 450 tons, to McClintic-Marshall Co.

Union Tank Car Co., Whiting, Ind., 320 tons, to McClintic-Marshall Co.

Home Bank & Trust Co., Ashland and Division Streets, Chicago, bank building, 112 tons, to Hansell-Elecock Co.

Burnstine Garage, Chicago, 174 tons, to unnamed fabricator.

University of Nebraska, auditorium, 500 tons, to Standard Bridge Co., Omaha.

City of Oakland, Cal., one year's requirement for steel pipe and ball joints, 125 tons, to Pacific Coast Engineering Co.

Shell Co. of California, San Francisco, four welded stills, 100 tons, to Steel Tank & Pipe Co.

Apartment house, Ellis and Hyde Streets, San Francisco, 145 tons, to Central Iron Works.

Nickel Plate Railroad, bridge at Oldfort, Ohio, 800 tons, to Bethlehem Steel Corporation.

Union Carbide Co., Niagara Falls, N. Y., building, 150 tons, to American Bridge Co.

Huron Street Garage, Toledo, 600 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

New York-New Jersey vehicular tunnel, 1500 tons for New Jersey approach, previously noted; Public Service Production Co. is low bidder for general contract but award has not yet been made.

Erie Railroad, pier No. 9, Hudson River, 7700 tons.

New York Rapid Transit Co., storage building in Brooklyn, 500 tons.

Public Service of Newark, generator building, 700 tons.
Johns Hopkins University, Baltimore, additional buildings, 1500 tons.

General Hospital, Philadelphia, 3000 tons.

Masonic Temple, Dayton, Ohio, 1500 tons; general contract awarded to H. R. Blagg Co., Dayton.

Irvin S. Cobb Hotel, Paducah Ky., tonnage unknown; Maritz & Young, St. Louis, architects.

Wabash Railway, 3 deck plate girder spans, 145 tons.

Commonwealth Edison Co., Kenwood substation, Chicago, 140 tons.

City of Milwaukee, municipal service shop, 250 tons; bids close July 15.

Mission High School, Eighteenth and Dolores Streets, San Francisco, 800 tons, Pacific Rolling Mill Co., low bidder.

Y. W. C. A. building 941 South Figueroa Street, Los Angeles, 900 tons, Baker Iron Works, low bidder.

East High School, Buffalo, 1000 tons.

Hotel Lincoln, Akron, Ohio, 1000 tons.

San Francisco Engineers to Supervise Re-building of Santa Barbara

SAN FRANCISCO, July 1.—Three of the foremost engineers on the Pacific Coast left here last night to assist in an immediate survey for the reconstruction of Santa Barbara, Cal., which suffered an estimated property loss of \$25,000,000 in the earthquake of June 29. C. E. Grunsky, president of the American Society of Civil Engineers; Prof. Charles B. Wing, head of the civil engineering department of Leland Stanford University, and Prof. C. D. Marx, ex-president of the American Society of Civil Engineers and chief of the structural engineering department at Stanford University, constituted the committee sent by the San Francisco Chamber of Commerce in response to a request from the city government of Santa Barbara. These are three of the engineers who helped to re-build San Francisco after the disaster of 1906.

Chicago Iron and Steel Market

(Concluded from page 105)

difficulty in complying with these demands. If the pressure from that direction increases the market is likely to stiffen. Railroad offerings are light. The Elgin, Joliet & Eastern has issued a list of 275 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$17.00 to \$17.50
Cast iron car wheels	17.00 to 17.50
Relaying rails, 56 and 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	18.25 to 18.75
Railroad tires, charging box size	18.50 to 19.00
Railroad leaf springs, cut apart	18.50 to 19.00
Rails for rolling	17.25 to 17.75
Steel rails, less than 3 ft.	18.00 to 18.50
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	16.50 to 17.00
Shoveling steel	15.25 to 15.75
Drop targe flashings	11.00 to 11.50
Hydraulic compressed sheets	13.00 to 13.50
Axle turnings	12.75 to 13.25
Steel angle bars	17.25 to 17.75
Steel knuckles and couplers	18.00 to 18.50
Coil springs	18.50 to 19.00
Low phos. punchings	17.00 to 17.50
Machine shop turnings	9.00 to 9.50
Cast borings	10.75 to 11.25
Short shoveling turnings	10.75 to 11.25
Railroad malleable	17.50 to 18.00
Agricultural malleable	17.00 to 17.50

Per Net Ton	
Iron angle and splice bars	16.50 to 17.00
Iron arch bars and transoms	20.00 to 20.50
Iron car axles	26.00 to 26.50
Steel car axles	16.50 to 17.00
No. 1 busheling	11.00 to 11.50
No. 2 busheling	8.50 to 9.00
Pipes and flues	10.50 to 11.50
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	13.75 to 14.25
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	16.00 to 16.50
No. 1 agricultural cast	16.00 to 16.50
Locomotive tires, smooth	18.00 to 18.50
Stove plate	14.00 to 14.50
Grate bars	14.00 to 14.50
Brake shoes	14.00 to 14.50

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery								
	Copper, New York		Straits Tin (Spot)	Lead		Zinc		
	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis	
July								
1.....	13.87½	13.50	57.25	8.00	7.85	7.35	7.00	
2.....	13.87½	13.50	57.25	8.00	7.85	7.37½	7.02½	
3.....	14.00	13.62½	57.25	8.00	7.85	7.40	7.05	
6.....	14.00	13.62½	57.25	8.10	7.85	7.42½	7.07½	
7.....	14.00	13.62½	57.50	8.10	7.85	7.45	7.10	

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, July 7.

The markets are moderately active and strong. Copper is higher on more active buying. Moderate purchases of tin have kept prices at recent levels. A slightly stronger lead market is attributed to speculative activity. The zinc market is more active and stronger.

Copper.—As a result of fairly heavy buying for both domestic and foreign account in the past week or ten days, the electrolytic copper market is stronger and higher. The price of 13.87½c., delivered, to which the market had advanced yesterday, was gradually disappearing today. Most producers have withdrawn from the market at less than 14c., delivered, but some metal was still available at ¼c. less late today. The establishing of the 14c. level within a day or two is freely predicted. Another cause for the stronger market is the unofficial report that stocks of refined copper on the first of July were the lowest in several years. If this is true, the contention that production has been curtailed and that deliveries into consumption have been heavy is evidently established. Strong proof of the confidence of some in the future of the market is contained in the fact that a very large and influential London speculator made bids for 12,000 tons of copper for delivery at 2000 tons per month in the first half of next year at present market prices. The same speculator today was bidding for a large tonnage for delivery late this year. Lake copper is quoted at 14c., delivered.

Tin.—Sales of Straits tin, though smaller than last week, have been in fair volume, the total having been 1000 to 1200 tons. Consumers were fairly liberal buyers but dealers were also active. Yesterday buying was quite brisk, the total having been about 500 tons, with spot selling at 57.25c. as the highest price and futures at 56.50c. as the lowest. Tin plate makers were the principal buyers yesterday with two of the largest bulls the sellers. Today the market has been inactive with spot Straits tin quoted at 57.50c., New York. In London quotations today were about £2 per ton higher than a week ago, with spot standard quoted at £254 12s. 6d., future standard at £257 and spot Straits at £259 2s. 6d. The Singapore price yesterday was £261 15s. Arrivals thus far this month have been 1770 tons, with 6128 tons reported afloat.

Lead.—Speculators are reported to have been active recently and to have bought most of the cheap lead available. It is stated that this has caused consumers to take more interest, so that the outside market is stated to be from 8.10c. to 8.20c., New York, or 7.80c. to 7.90c., St. Louis. Some metal is reported to have changed hands at these levels. Usually at this time this market is exceedingly quiet and it will take a few days to determine its future course. The leading interest continues to quote 8c., New York, as its contract price, at which it is taking some business.

Zinc.—After oscillating for several weeks between 6.95c. and 7.05c., St. Louis, the zinc market this week has advanced to 7.10c. to 7.12½c., St. Louis. Domestic buying continues very light, but there have been fairly heavy sales for export.

Nickel.—Wholesale lots of ingot nickel are quoted at 34c. per lb., with shot nickel at 35c. Electrolytic nickel is quoted at 38c.

Antimony.—Chinese metal in wholesale lots for spot delivery is quoted at 18.50c., New York, duty paid. Another scarcity in metal for spot delivery has developed.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

Old Metals.—The market is firm and buying has started again. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	13.25
Copper, heavy and wire	12.25
Copper, light and bottoms	11.00
Heavy machine composition	10.00
Brass, heavy	8.25
Brass, light	7.25
No. 1 red brass or composition turnings ..	9.00
No. 1 yellow rod brass turnings	9.00
Lead, heavy	7.00
Lead, tea	6.25
Zinc	5.00
Cast aluminum	19.00
Sheet aluminum	19.50

Chicago

JULY 7.—Tin and copper have advanced, while lead and zinc are lower than a week ago. Lead, however, has shown some recovery from a weak position which was most pronounced the middle of last week. Zinc is dull and weak and antimony is quiet. Copper is in better demand and has gained in strength as cheap offerings have disappeared from the market. Tin is strong with demand only fair. Among the old metals grades of copper, brass, lead and zinc have gone up. We quote, in carload lots: Lake copper, 14c.; tin, 58.50c.; lead, 7.90c.; zinc, 7.10c.; in less than carload lots, antimony, 19c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.50c.; red brass, 8.50c.; yellow brass, 7.25c.; lead pipe, 6.75c.; zinc, 4.25c.; pewter, No. 1, 30c.; tin foil, 37c.; block tin, 42c.; all buying prices for less than carload lots.

Developments in Massachusetts

During the summer months the plant of the L. S. Starrett Co., Athol, Mass., maker of small tools, will be operated on a 45-hr. weekly schedule instead of 50 as heretofore.

Within a month or so the National Mfg. Co., 19 Union Street, Worcester, a subsidiary of the Wickwire Spencer Steel Corporation, will be moved to Clinton, Mass.

The Hopedale Mfg. Co., Milford, Mass., builder of cotton textile machinery, announces that Randolph Crompton has become associated with the company as vice-president, general manager and director. Mr. Crompton was formerly connected with the Crompton Loom Works, as managing director; Crompton-Knowles Loom Works, as vice-president and managing director; Crompton Works, Worcester, Mass.; Crompton-Thayer Co., as president and general manager; and more recently with the Mason Machine Works Co., as manager of the loom department. Coincident with his becoming associated with the Hopedale Mfg. Co. is the acquisition by that company of the patterns and patents covering worsted and woolen looms formerly manufactured by J. J. McCloskey, Collinswood, N. J., and the patents and patterns covering silk looms formerly manufactured by Mason Machine Works Co., Taunton, Mass. The company is prepared to enter the gingham loom trade. Harry Gage Baker, associated with Mr. Crompton, has joined the Hopedale Mfg. Co. sales force.

To automatic arc welding is devoted a Bulletin, 48937.1, of the General Electric Co. It describes apparatus for welding tanks and other materials automatically at a rate far more rapid than the hand method and presents figures showing costs. Also it shows applications in considerable detail and is well illustrated.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.	1.90c.
F.o.b. Chicago, base, per lb.	2.10c. to 2.20c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.	2c.
F.o.b. Chicago, base, per lb.	2.10c. to 2.20c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.	2c.
Soft steel bars f.o.b. Chicago, base, per lb.	2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.	2c.
Rail steel bars, f.o.b. Chicago district mills, base, per lb.	2.00c.
Common iron bars, f.o.b. Chicago, base, per lb.	2.00c.
Refined iron bars, f.o.b. P'gh mills, base, per lb.	3.00c.
Common iron bars, eastern Pa. mill, base, per lb.	2.10c.

Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh	2.40c.
Bands, base, per lb., Pittsburgh	2.40c.
Strips, 6 in. and narrower, base, per lb., Pittsburgh	2.40c.
Strips, 6 in. and wider, base, per lb., Pittsburgh	2.20c.
Strips, 6 in. and narrower, Chicago	2.50c.
Strips, wider than 6 in., Chicago	2.40c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.	2.60c.
Screw stock and shafting, f.o.b. Chicago, base, per lb.	2.60c.
Screw stock, base, per lb., Cleveland	2.65c.
Shafting, ground, f.o.b. mill, base, per lb.	3.00c.
Strips, f.o.b. P'gh mills, base, per lb.	3.50c. to 3.75c.
Strips, f.o.b. Cleveland mills, base, per lb.	3.50c. to 3.75c.
Strips, f.o.b. delivered Chicago, base, per lb.	3.80c. to 3.90c.
Strips, f.o.b. Worcester mills, base, per lb.	3.90c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.	\$2.65
Galvanized nails, 1-in. and longer, base plus.	2.00
Galvanized nails, shorter than 1 in., base plus.	2.25
Bright plain wire, base, No. 9 gage, per 100 lb.	2.50
Annealed fence wire, base, per 100 lb.	2.65
Spring wire, base, per 100 lb.	3.50
Galvanized wire, No. 9, base, per 100 lb.	3.10
Galvanized barbed, base, per 100 lb.	3.35
Galvanized staples, base, per keg.	3.35
Painted barbed wire, base, per 100 lb.	3.10
Polished staples, base, per keg.	3.10
Cement coated nails, base, per count keg.	1.85
*Bale ties, carloads, to jobbers, .75, 15 and 5 per cent off list	
*Bale ties, carloads, to retailers, .75, 10 and 6 per cent off list	
Woven wire fence, base, per net ton to retailers.	\$65

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh	2.25c. to 2.40c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills	2.45c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh	3.10c. to 3.20c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill	3.30c. to 3.35c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh	4.15c. to 4.25c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill	4.35c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh	3.10c. to 3.20c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill	3.25c. to 3.40c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh	4.15c. to 4.25c.
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Long Terns

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill	4.60c. to 4.75c.
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Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills	\$5.50
Standard cokes, per base box f.o.b. Chicago district mills	5.60
Standard cokes, per base box f.o.b. Elwood, Ind.	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb.	20-lb. coating I. C.	\$15.50
base	25-lb. coating I. C.	\$17.00
8-lb. coating I. C.	30-lb. coating I. C.	\$18.35
15-lb. coating I. C.	40-lb. coating I. C.	\$20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb.	\$2.40 to \$2.60
Large, f.o.b. Chicago, base, per 100 lb.	2.65
Small, f.o.b. Pittsburgh	.70 and 10 per cent off list
Small, Cleveland	.70 and 10 to 70, 10 and 5 per cent off list
Small, Chicago	.70 and 10 to 70, 10 and 5 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton	\$43.00
Rails, light, billet, base, per lb.	1.70c. to 1.75c.
Rails, light rail steel, base, per lb.	1.65c. to 1.70c.
Spikes, $\frac{5}{16}$ in. and larger, base, per 100 lb.	\$2.80 to \$3.10
Spikes, $\frac{1}{2}$ in. and smaller, base, per 100 lb.	3.00 to 3.35
Spikes, boat and barge, base, per 100 lb.	3.25
Track bolts, all sizes, base, per 100 lb.	3.90 to 4.25
Tie plates, per 100 lb.	2.35 to 2.40
Angle bars, base, per 100 lb.	2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld			Iron		
Inches	Steel	Galv.	Inches	Black	Galv.
$\frac{1}{8}$	45	19 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+39
$\frac{1}{4}$ to $\frac{3}{8}$	51	25 $\frac{1}{2}$	$\frac{1}{2}$	22	2
$\frac{1}{2}$	56	42 $\frac{1}{2}$	$\frac{3}{4}$	28	11
$\frac{3}{4}$	60	48 $\frac{1}{2}$	1 to 1 $\frac{1}{2}$	30	13
1 to 3	62	50 $\frac{1}{2}$			
2	55	43 $\frac{1}{2}$	2	23	7
2 $\frac{1}{2}$ to 6	59	47 $\frac{1}{2}$	2 $\frac{1}{2}$	26	11
7 and 8	56	43 $\frac{1}{2}$	3 to 6	28	13
9 and 10	54	41 $\frac{1}{2}$	7 to 12	26	11
11 and 12	53	40 $\frac{1}{2}$			

Lap Weld

2	55	43 $\frac{1}{2}$	2	23	7
2 $\frac{1}{2}$ to 6	59	47 $\frac{1}{2}$	2 $\frac{1}{2}$	26	11
7 and 8	56	43 $\frac{1}{2}$	3 to 6	28	13
9 and 10	54	41 $\frac{1}{2}$	7 to 12	26	11
11 and 12	53	40 $\frac{1}{2}$			

Butt Weld, extra strong, plain ends

$\frac{1}{8}$	41	24 $\frac{1}{2}$	2 to 3	61	50 $\frac{1}{2}$
$\frac{1}{4}$ to $\frac{3}{8}$	47	30 $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	+11	+54
$\frac{1}{2}$	53	42 $\frac{1}{2}$	$\frac{1}{2}$	21	7
$\frac{3}{4}$	58	47 $\frac{1}{2}$	$\frac{3}{4}$	28	12
1 to 1 $\frac{1}{2}$	60	49 $\frac{1}{2}$	1 to 1 $\frac{1}{2}$	30	14

Lap Weld, extra strong, plain ends

2	53	42 $\frac{1}{2}$	2	23	9
2 $\frac{1}{2}$ to 4	57	46 $\frac{1}{2}$	2 $\frac{1}{2}$ to 4	29	15
4 $\frac{1}{2}$ to 6	56	45 $\frac{1}{2}$	4 $\frac{1}{2}$ to 6	28	14
7 to 8	52	39 $\frac{1}{2}$	7 to 8	21	7
9 and 10	45	32 $\frac{1}{2}$	9 to 12	16	2
11 and 12	44	31 $\frac{1}{2}$			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 $\frac{1}{2}$ points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 $\frac{1}{2}$ per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base 2 $\frac{1}{2}$ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		Charcoal Iron	
2 to 2 $\frac{1}{4}$ in.	27	1 $\frac{1}{2}$ in.	+18
2 $\frac{1}{2}$ to 2 $\frac{3}{4}$ in.	37	1 $\frac{3}{4}$ to 1 $\frac{7}{8}$ in.	+8
3 in.	40	2 to 2 $\frac{1}{4}$ in.	—2
3 $\frac{1}{4}$ to 3 $\frac{3}{4}$ in.	42 $\frac{1}{2}$	2 $\frac{1}{2}$ to 3 in.	—7
4 to 13 in.	46	3 $\frac{1}{4}$ to 4 $\frac{1}{2}$ in.	—9

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot-Rolled	
1 in.	60	3 in.	45
1 $\frac{1}{4}$ and 1 $\frac{1}{2}$ in.	52	3 $\frac{1}{4}$ to 3 $\frac{1}{2}$ in.	47
1 $\frac{3}{4}$ in.	36	4 in.	50
2 and 2 $\frac{1}{4}$ in.	31	4 $\frac{1}{2}$, 5 and 6 in.	45
2 $\frac{1}{2}$ and 2 $\frac{3}{4}$ in.	39		

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base	85 to 87 per cent off list
Carbon 0.30 to 0.40 base	83 to 85 per cent off list

Plus usual differentials and extra for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage	14 $\frac{1}{4}$	2 $\frac{1}{4}$ -in. O.D. 10 gage	18
2-in. O.D. 11 gage	15	3-in. O.D. 7 gage	33
2-in. O.D. 10 gage	16	1 $\frac{1}{2}$ -in. O.D. 9 gage	15
2 $\frac{1}{4}$ in O.D. 12 gage	16	5 $\frac{3}{4}$ -in. O.D. 9 gage	50
2 $\frac{1}{4}$ -in. O.D. 11 gage	17	5 $\frac{1}{2}$ -in. O.D. 9 gage	52

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron.....	\$4.55
Old range non-Bessemer, 51½ per cent iron.....	4.40
Mesaba Bessemer, 51.50 per cent iron.....	4.40
Mesaba non-Bessemer, 51.50 per cent iron.....	4.25
High phosphorus iron, 51.50 per cent.....	4.15

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$11.00 to \$11.50
Chrome ore, Indian basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f., Atlantic seaboard...	20.00 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	65c. to 70c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$2.75 to \$2.85
Foundry coke, f.o.b. Connellsville prompt.....	3.75 to 4.25
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines.....	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.35 to 1.40
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.60

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	82.50 to 85.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal....	1.00
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$32.00
Spiegeleisen, domestic, 16 to 19 per cent.....	31.00
Ferrosilicon, Bessemer, 10 per cent, \$33; 11 per cent, \$35; 12 per cent, \$37; electric furnace ferrosilicon, 10 per cent, \$38; furnace with an advance of \$1 per unit for material above 10 per cent.	
Silvery iron, 6 per cent, \$24; 7 per cent, \$25; 8 per cent, \$25 to \$26; 9 per cent, \$27.50; 10 per cent, \$29; 11 per cent, \$31; 12 per cent, \$33.	

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, gravel, per net ton, f.o.b. Illinois and Kentucky mines	\$16.00 to \$16.50
No. 2 lump, per net ton.....	17.00 to 17.50
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	18.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	32.50
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania	High Duty \$43.00 to \$46.00 Moderate Duty \$40.00 to \$43.00
Maryland	48.00 to 50.00 43.00 to 45.00
Ohio	43.00 to 46.00 40.00 to 43.00
Kentucky	43.00 to 45.00 40.00 to 43.00
Illinois	43.00 to 45.00 40.00 to 43.00
Missouri	40.00 to 43.00 35.00 to 38.00
Ground fire clay, per ton.....	6.50 to 7.50
Silica Brick:	
Pennsylvania	40.00
Chicago	49.00
Birmingham	54.00
Silica clay, per ton.....	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads..60 and 10 per cent off list	
Machine bolts, all sizes, cut threads, 50, 10 and 10 per cent off list	
Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list	
Carriage bolts, cut threads, all sizes..50 and 10 per cent off list	
Eagle carriage bolts .....	.65 and 10 per cent off list
Lag bolts .....	.60, 10 and 10 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list	

Other style heads 20 per cent extra

Machine bolts, c.p.c. and t. nuts, ¾ x 4 in. 45, 10 and 5 per cent off list

Larger and longer sizes..... 45, 10 and 5 per cent off list

Hot-pressed nuts, blank or tapped, square..... 4c. off list

Hot-pressed nuts, blank or tapped, hexagons..... 4.40c. off list

C.p.c. and t. square or hex. nuts, blank or tapped..... 4.10c. off list

Bolt ends with hot pressed nuts..50, 10 and 10 per cent off list

Bolt ends with cold pressed nuts....45, 10 and 5 per cent off list

Washers* 6c. to 5.50c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:

¾ in. and smaller, U. S. S. 80, 10 and 5 per cent off list

¾ in. and larger, U. S. S. 75, 10 and 5 per cent off list

Small sizes, S. E. E. 80, 10 and 5 per cent off list

S. A. E., ¾ in. and larger..... 75, 10 and 5 per cent off list

Stove bolts in packages..... 80, 10 and 5 per cent off list

Stove bolts in bulk..... 80, 10, 5 and 2½ per cent off list

Tire bolts 50, 10 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

Per 100 Net				Per 100 Net			
S. A. E.		U. S. S.		S. A. E.		U. S. S.	
¼-in.	\$0.44	\$0.44		¾-in.	\$2.35	\$2.40	
½-in. ....	.515	.515		1-in.	3.60	3.60	
¾-in. ....	.62	.66		1½-in.	5.65	5.80	
1-in. ....	.79	.90		2-in.	8.90	8.90	
1½-in.	1.01	1.05		2½-in.	12.60	13.10	
2-in.	1.38	1.42		3-in.	18.35	18.35	
2½-in.	1.70	1.73		3½-in.	21.00	21.00	

Larger sizes—Prices on application.

Cap and Set Screws

Freight allowed within zone limits)

Milled cap screws.....80, 10 and 5 per cent off list	
Milled standard set screws, case hardened, 80 and 10 per cent off list	
Milled headless set screws, cut thread, 80 and 10 to 80 per cent off list	
Upset hex. head cap screws, U. S. S. Thread, 80, 10, 10 and 5 per cent off list	
Upset hex. cap screws, S. A. E. thread, 80, 10, 10 and 5 per cent off list	
Upset set screws.....80, 10, and 10 per cent off list	
Milled studs .....75 per cent off list	

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling Billets, 4-in. and over.....	\$33.50 to \$35.00
Forging Billets, ordinary.....	38.50 to 40.00
Forging billets, guaranteed.....	43.50 to 45.00
Sheet bars	35.00
Slabs	35.00 to 35.00
*Wire rods, common soft, base, No. 5 to ¾-in.	45.00
Wire rods, common soft, coarser than ¾-in.	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp grooved, per lb.....	1.90c. to 2c.
Skelp, sheared, per lb.....	1.90c. to 2c.
Skelp, universal, per lb.....	1.90c. to 2c.

*Chicago mill base is \$47. Cleveland mill base, \$45.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100* (¼% Nickel, 10 to 20 per cent Carbon)...	\$3.00 to \$3.25
2300 (3% Nickel)	4.50 to 4.75
2500 (5% Nickel)	6.00 to 6.25
3100 (Nickel Chromium)	3.50 to 3.65
3200 (Nickel Chromium)	5.50
3400 (Nickel Chromium)	7.50 to 7.75
5100* (Chromium Steel)	6.50 to 6.75
5200* (Chromium Steel)	3.50
6100 (Chromium Vanadium bars)	7.50 to 8.00
6100 (Chromium Vanadium spring steel).....	4.25 to 4.50
9250 (Silicon Manganese spring steel).....	4.00 to 4.25
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	3.50
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	4.25 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....	3.75
Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.	4.75 to 5.00

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

PERSONAL

J. A. Roesch, Jr., vice-president Steel Sales Corporation, Chicago, has been elected president to succeed Albert D. Dorman, president and treasurer, who died



J. A. ROESCH, JR.

June 27. F. W. Walters, heretofore general sales manager, has been elected vice-president and general sales manager, and D. R. Hoffman, heretofore secretary, has been elected secretary and treasurer, succeeding Mr. Dorman in the latter position. W. C. French has been elected to the vacancy on the board of directors. All of the officers have been identified with the Steel Sales Corporation since its organization ten years ago. Prior to that time they were with the Charles G. Stevens Co., Chicago, for from five to six years respectively. Prior to the



F. W. WALTERS



D. R. HOFFMAN

connection with the Stevens organization, Mr. Roesch was for six years associated with the Western Electric Co., Chicago. Mr. Hoffman was for eleven years with the American Electric Co., Chicago, before going with the Stevens Company. Mr. Walters' first experience was at South Works, Illinois Steel Co., Chicago.

J. E. Morgan, formerly Philadelphia manager for the Harbison-Walker Refractories Co., and later with the General Refractories Co., has organized the Woodbridge Fire Brick Co., at Woodbridge, N. J., and has been elected president of the company.

Ernest V. Squier has been appointed representative of the Greasalt Products Corporation, Syracuse, for the State of Michigan outside of Detroit. Edward F. Clemett will handle sales in Detroit and Toledo.

Herbert G. Cook has been appointed Pacific Coast representative of the Railway Steel-Spring Co., with headquarters at 582 Market Street, Hobart Building, San Francisco.

John Baxter, superintendent of the tube mill department of the Republic Iron & Steel Co., at Youngstown, sailed recently for Scotland. During his absence, the mills are in charge of Thomas J. Maloney, assistant superintendent.

Col. Frank A. Scott, president Warner & Swasey Co., Cleveland, was given a certificate of notable service on June 30 by the War Department in connection with the procurement of supplies during the war. He was chairman of the general munitions board and first chairman of the War Industries Board. He is now chief of the Cleveland District Ordnance office.

John F. Schurch, vice-president at Chicago for Manning, Maxwell & Moore, Inc., has been elected president, with headquarters at New York. Owing to the recent resignation of John M. Davis, who was elected president of the Delaware, Lackawanna & Western Railroad, Mr. Schurch assumes immediate charge. Mr. Schurch came to the Manning, Maxwell & Moore organization in 1922 as vice-president at Chicago. He was born at Minneapolis, Minn., in 1872, and attended the University of Minnesota. For ten years he was identified with the Minneapolis, St. Paul & Sault Ste. Marie Railway in various capacities in both the traffic and operating departments. At the time he left that company, he was chief clerk to the president, E. Pennington, who is now chairman of the board. For five years he was vice-president Railway Materials Co. at Chicago, following which he was vice-president and later president of the Damascus Brake Beam Co., Cleveland, now owned by the American Steel Foundries. After a period of four or five years in Cleveland, he went to Rochester, N. Y., where he was president of the Locke Insulator Mfg. Co., and other Symington interests during the war period. This was his last connection prior to going with Manning, Maxwell & Moore.



J. F. SCHURCH

Frank R. Schubert has been appointed general manager of the Strom Ball Bearing Mfg. Co., Chicago. John Dlesk succeeds him as works manager, and Lorenz Peterson continues as assistant works manager in charge of production.

Stanley A. Richardson has resigned as assistant professor of metallurgy in the Lewis Institute, Chicago, to join the metallurgical staff of the Interstate Iron & Steel Co. He inaugurated and conducted evening courses in metallurgy offered to practical men in Chicago.

B. A. Tozzer, who has been manager of the Cleveland sales office of the Niles-Bement-Pond Co., New York, has been appointed district sales manager of the New York territory, with headquarters at 111 Broadway, New York. He succeeds Harold F. Welch, who was recently appointed general manager of sales at Hamilton, Ohio. A. E. R. Turner, who was manager of the plant of John Bertram & Sons Co., Ltd., machine tool manufacturer, has been appointed Cleveland manager, succeeding Mr. Tozzer.

V. O. Strobel, for many years works manager of the crane works of the Niles-Bement-Pond Co. in Philadelphia, has resigned, due to ill health, and has been succeeded by Sydney Buckley, who was chief engineer of the same plant.

Charles H. Griffin, manager Deutsch Norton Gesellschaft of Germany; Frank M. Ryan, manager of works at La Courneuve, France; Harry E. Howard, Harishima, the Japan plant, and Albert Johnson of the Canadian plant, are at the works of the Norton Co., Worcester, Mass., the parent company, making a study of production methods.

T. J. Litle, Jr., chief engineer, Lincoln division, Ford Motor Co., and now first vice-president of the Society of Automotive Engineers, was nominated for election next January to the presidency of the society for 1926 at the semi-annual meeting of the organization last month. Other nominations were J. H. Hunt of the General Motors Research Corporation, for first vice-president; G. W. Smith, chief engineer Nash Motors Co.; Arthur Nutt, chief motor engineer Curtiss Aeroplane & Motor Corporation, and C. O. Guernsey, chief engineer automotive car division J. G. Brill Co., for second vice-presidents.

Dr. Nand Singh, for six years professor in the college of engineering, Marquette University, Milwaukee, has resigned and will return to India to undertake important research work for the tractor department, Ford Motor Co. He is a graduate of Punjab University, and Victoria Jubilee Technical Institute, Byculla, Bombay, and came to Milwaukee in 1916 to become associated with the International Harvester Co.

Dr. Otto P. Geier, medical director of the Employees' Service Department of the Cincinnati Milling Machine Co., has returned home from a study of European factory conditions made by him as a member of the Industrial Health Interchange Commission of the League of Nations. He was the official delegate of the United States Government on the commission.

J. B. Chalmers, who has been assistant to the general superintendent of the Gary tin mill plant of the American Sheet & Tin Plate Co., Gary, Ind., has resigned, effective July 1, to become superintendent of the new plant of the Youngstown Sheet & Tube Co. at Indiana Harbor, where 24 tin mills are now under construction.

L. H. Underwood has been appointed superintendent of blast furnaces at the Indiana Harbor plant of the Youngstown Sheet & Tube Co. He had been superintendent of blast furnaces at the Gary, Ind., plant of the United States Steel Corporation.

A. V. Spinosa, Pittsburgh, vice-president of the Penn Metal Co., Cambridge, Mass., will be in charge of the new plant now being erected for that company at Parkersburg, W. Va.

Charles H. Urquhart will have charge of the sales for the Columbia Steel Corporation in the territory comprising Arizona, New Mexico and Texas, with headquarters at 310 Luhrs Building, Phoenix, Ariz.

H. R. Reddington, National Tube Co., lectured on pipe production at a sales conference held by the Williams Tool Corporation at Erie, Pa. Horace Davis, president Williams Tool Corporation, at the meeting, reviewed the past 25 years' business. Representatives of machinery jobbers attended the conference as well as the sales force of the company.

Chairman E. H. Gary of the United States Steel Corporation, is expected to return to Birmingham, Ala., next week for continuation of his diet observation at the Tennessee company's hospital and also for further inspection of that company's properties.

The fifth annual week-end conference on "Human Relations in Industry" will be held July 17 to 19, and the school for industrial, railroad and business executives, July 20 to 25, at the Y. M. C. A. conference grounds, Rocky Mountain National (Estes) Park, Colorado. Among those to address the school will be B. J. Matteson, president's industrial representative, Colorado Fuel & Iron Co., Pueblo, who will speak on "Building and Maintaining Confidence in Industrial Operations." E. H. Weitzel, vice-president and general manager of the Fuel & Iron company, is on the general committee. A. B. Minear, industrial secretary, National Council of Y. M. C. A.'s, Denver, is in charge of arrangements.

OBITUARY

THOMAS JESSE HYMAN, secretary and treasurer Illinois Steel Co., died at the Presbyterian Hospital, Chicago, July 5, following a mastoid operation. He was



T. J. HYMAN

70 years of age, having been born at Camanche, Clinton County, Iowa, April 8, 1855. Educated in the public schools of that town, Iowa State College, and Eastman's National Business College, he started out in the transportation field. In 1876 he entered the employ of the Sioux City & Pacific Railroad as bookkeeper and paymaster. From 1880 to 1884 he was paymaster and freight auditor for the St. Paul & Sioux City Railroad. From 1885 to 1887 he was auditor of the Wisconsin Central lines. By 1892-3 he had become assistant

to the president of the Great Northern Railway. He was also identified with the Evansville & Terre Haute, the Wisconsin Central and with the company which constructed the Grand Central station in Albany. He was one of the organizers and a charter member of the Association of Railway Accounting Officers in the eighties. Since 1899 he has filled the position of secretary and treasurer of the Illinois Steel Co., a director in the Universal Portland Cement Co., but he was also director and officer of various other United States Steel Corporation subsidiaries. His home had been in Oak Park, Ill., for 37 years.

GEORGE A. WOOD, president T. B. Wood's Son's Co., Chambersburg, Pa., manufacturer of bearings and transmission equipment, died June 17 at his home.

JOHN W. REID, JR., president Belle City Mfg. Co., Racine, Wis., manufacturer of agricultural machinery, died June 29, after an illness of one year. He was born in Brooklyn, N. Y., Oct. 3, 1878, and was a graduate of Yale. He went to Racine in 1912 to become associated with the J. I. Case Threshing Machine Co., later being made president of the Belle City company.

J. HARVEY FINCH, New York district sales manager, Sweets Steel Co., Williamsport, Pa., died in New York July 2. He was 46 years old and had represented the Sweets Steel Co. in the metropolitan area for ten years.

Two pamphlets devoted respectively to sheet steel and to plow bolts have been issued by the Department of Commerce under the heading "Elimination of Waste: Simplified Practice." Copies of either may be obtained at 5c. each from the Superintendent of Documents, Government Printing Office, Washington. The sheet steel pamphlet shows the recommended sizes for galvanized, box annealed and blue annealed sheets, giving tables by gage thickness and dimensions in inches. The other pamphlet gives the recommended practice in connection with bolts of various descriptions known under the general heading of plow bolts.

The handbook on management published by *Management and Administration*, 15 East Twenty-sixth street, New York, is now being translated into German for publication under the auspices of the Verein Deutscher Ingenieure.

Auxiliary Equipment in Foundries

(Concluded from page 73)

democracy system of management, encouraged the men to make recommendations for improving working conditions. The fine cleaning room in this plant was the result of such recommendations. There was no dust in the atmosphere. The floors were free of dust, and the white-washed walls remained white.

This was accomplished by equipping the cleaning mills with a dust-collecting system, which was properly maintained because the men insisted on good air in the cleaning room. Perhaps conditions such as these may suggest the solution for the large turnover in the cleaning room forces experienced by a large number of foundries.

Laboratory Control in the Foundry

Control of Metals.—Buyers of castings usually specify the chemical and physical properties of their purchases. Allowed variations from specified requirements are becoming smaller. Alert foundry managers are making use of the laboratory as the most effective means of controlling variations and turning out the product specified.

The larger foundries have their own laboratories and a close check on both charge and melt is kept by them. The following table shows the control over the



Fig. 5—Traveling crane with magnet

metal introduced into castings as practised in the foundries visited.

	Num- ber	Per Cent of Total
Foundries having their own laboratories..	16	30
Foundries analyzing charge continuously..	16	30
Foundries analyzing charge occasionally..	5	9
Foundries analyzing melt daily.....	22	40
Foundries analyzing melt occasionally.....	10	18

This table shows (through absence of some foundries from the lists) that many foundries are working in complete or partial ignorance of the composition of castings. Guesswork is used instead of analysis by such foundries, in attempts to correct faulty casting methods.

Besides plant laboratories there are commercial companies equipped to make analyses of charges and melts. Through these means the foundry manager is able to know exactly the contents of the cupola charge and to determine the make-up of castings.

In some automobile plants records are kept of the analysis of metal entering each casting. Failure in an individual car can be traced to a particular melt and the make-up of the faulty casting determined. In this manner the castings in cars serve as adjuncts to the laboratory, for in daily use they are continually undergoing tests which determine wearing qualities. Failures reported assist materially in determining the proper metal for the conditions tested.

A machine tool plant visited had a unique means for studying defective castings. The history of each pattern was recorded on a card containing an outline sketch, in addition to general data. Reports on defective castings also contained data in regard to (1) cause, (2) type, and (3) location of the defect.

These data, and such additional information as the analysis of the melt used, the sand employed and the method of molding, were written on the sketch of the pattern on the record card. Before a pattern was placed in the sand its history was looked up and precautions were taken to avoid recurrence of defects.

Control of Temperature.—Cores are often a source of difficulty, due to overbaking or underbaking. Several installations for the control of oven temperature were observed. In plants having such installations oven conditions had been studied and an exact procedure outlined for temperatures and length of baking.

Control of Sand.—Though a relatively small item in the direct cost of the foundry, molding sand nevertheless vitally affects cleaning costs, labor, material and expense involved in rejected castings. The selection of a suitable sand is given careful consideration by efficient foundries. Three plants visited in the survey had laboratory equipment designed for the study of sands. Sand producing companies equipped with laboratories give aid in making selections for individual requirements.

By obtaining facts and applying them in the operation of his plant, the foundry manager can predict his output with certainty. In the words of several successful managers: "Laboratory control pays."

Auxiliary Equipment Purchase

Auxiliary equipment adapted to the various phases of foundry operation results in measurable savings when intelligently acquired. The manager, of course, must not lose sight of the ultimate aim of his enterprise—operation at a profit. When the savings of labor, material and expense compensate adequately for the interest on the investment and the upkeep of the equipment, then and only then is the manager acting wisely in installing such equipment.

Savings have been accomplished by the adoption of auxiliary equipment in many of the operations of the foundry. The survey has brought to light some interesting tendencies in foundry use of auxiliary equipment, chiefly toward the following ends:

1. Development of material handling equipment to facilitate conveying raw and finished products and to alleviate or eliminate laborious tasks.
2. Adoption of laboratory control, to do away with faulty practices and to increase the salable production of the foundry.
3. Improvement of conditions surrounding the workman.

Improvements in working conditions, such as found in the use of machinery for handling raw materials and removal of completed molds, and in well-kept ventilation systems for cleaning rooms, show the efforts of the industry to induce men to embrace and continue this means of obtaining a livelihood.

The positive efforts toward control of the metal content of castings, of the sand used in molding and core-making, and of oven temperatures in the baking of cores indicate constructive work toward securing quality output. Successful managers are found to be striving for complete control of the factors entering into the making of a good casting. Specified requirements, which are constantly being made more stringent, point the way to the adoption of closer control in the manufacture of castings.

Announcement was made recently at Tampa, Florida, by F. H. Wolfe, president Tampa Industrial Development Corporation, that the Tampa Steel Products Corporation had bought 2000 acres at Sulphur Springs near Tampa for the purpose of establishing an industrial town site and building a steel plant and rolling mills. It was stated that J. R. Finkelstein, formerly president of the Hoosier Rolling Mill Co. at Terre Haute, Ind., would be the head of the new Tampa company. The plans are said to include the building of three open-hearth furnaces and an 8-in. and a 20-in. mill. It was stated further that the new company plans to use fuel oil and that its raw material will be scrap.

Labor Troubles Dominate Markets

England and Belgium in Throes of Labor Union Disturbances—Business Badly Disorganized

(By Cablegram)

LONDON, ENGLAND, July 6.

AS the labor position is very much troubled, the outlook is most uncertain. The appeal of the steel industry for protection is likely to be disallowed by the Government. Pig iron is slow, consumers, both domestic and foreign, showing practically no interest. Foundry and hematite irons are weaker.

Foreign ore is dull. Bilbao Rubio is held nominally at 20s. 6d. (\$4.98) c.i.f. Tees.

There is very little fresh buying of finished materials and prices are easier. Probably further concessions are obtainable on suitable orders. German and Czechoslovakian works have secured a big order of iron pipe for South Africa, beating the lowest British tender by about £35,000 (\$170,000).

Clyde shipbuilding output in June consisted of 26 vessels launched, aggregating 43,428 tons gross register.

Sheets and Tin Plate

Tin plate is easier, on general slackness of buyers' offerings and an increasing need for orders on the part of some makers.

Galvanized sheets are moderately active on small orders, but there is no sign of a substantial demand.

Japan is buying further quantities of thin gage black sheets. Stocks in Japan have been diminished considerably.

On the Continent of Europe

Belgian labor troubles are spreading, but prices generally are easier on poor selling. Joists (beams) are being sold at £5 5s. (1.14c. per lb.) f.o.b. Thomas rods have been done at £7 5s. (1.57c.) c.i.f. Japan.

The German Raw Steel Association has been pro-

longed until October, 1929. An international rail syndicate is still under discussion.

Belgium and France are considering securing fair lines of German steel rails on reparation account.

British Iron and Steel Industry Facing Growing Discouragement

LONDON, ENGLAND, June 25.—The condition of the iron and steel trades of this country continues bad and at the moment the outlook is distinctly discouraging. Various disturbances in the labor world are in the air, chief among them being a threatened cessation of work in the coal mines at the end of next month, while it is possible also that the railroads may be involved on questions of reductions in wages.

In the meantime trading in iron and steel of British manufacture is about as bad as it can be. There is a complete lack of confidence both in prices and in demand on the part of consumers in the country, and users' stocks in consequence are kept within sufficiently low limits to supply immediate needs. Export trading has dwindled down to meager proportions of what it used to be, chiefly owing to the competition of the Continental producers, and the only business for shipment is really with countries where Great Britain is treated on preferential terms. The seriousness of the whole position is reflected in the balance sheets just disclosed of some well-known iron and steel companies, and in all cases losses have been incurred during the previous year.

Protective Tariff Discussed

It is not to be wondered at, therefore, from the manufacturers' point of view that attention is being drawn toward the Safeguarding of Industries Act, but whether anything in this direction would be of advan-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.86 per £1, as follows:

Durham coke, del'd.	£1 0 1/2 s.	\$4.98
Bilbao Rubio ore†	1 0 1/2	4.98
Cleveland No. 1 fdy.	3 16	to £3 16 1/2 s. 18.47 to \$18.59
Cleveland No. 3 fdy.	3 12 1/2	17.62
Cleveland No. 4 fdy.	3 11 1/2	17.39
Cleveland No. 4 forge	3 11	17.14
Cleveland basic	3 13 1/2	17.86
East Coast mixed	3 17 1/2	18.83
East Coast hematite	4 19	24.06
Ferromanganese	15 10	75.33
*Ferromanganese	15 5	74.11
Rails, 60 lb. and up.	8 10	to 9 0 41.31 to 43.74
Billets	6 10	to 7 5 31.59 to 35.23
Sheet and tin plate	6 12 1/2	to 6 15 32.20 to 32.80
bars, Welsh	0 19 1/4	to 0 19 1/2 4.68 to 4.74
Tin plates, base box.	0 19 1/4	to 0 19 1/2 4.68 to 4.74
Ship plates	8 7 1/2	to 8 17 1/2 1.82 to 1.93
Boiler plates	12 10	to 13 0 2.71 to 2.82
Tees	8 7 1/2	to 8 17 1/2 1.82 to 1.93
Channels	7 12 1/2	to 8 2 1/2 1.65 to 1.76
Beams	7 7 1/2	to 7 17 1/2 1.69 to 1.71
Round bars, 3/4 to 3 in.	8 17 1/2	to 9 7 1/2 1.93 to 2.04
Galv. sheets, 24 gage	16 0	to 16 2 1/2 3.47 to 3.50
Black sheets, 24 gage	11 15	2.55
Black sheets, Japanese	15 5	3.31
specifications	10 15	and 12 10* 2.33 and 2.71*
Steel hoops	10 15	and 12 10* 2.33 and 2.71*
Cold rolled steel strip,	16 0	3.47
20 gage		

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)				
Belgium	£3 2s.	to £3 3s.	\$15.07 to \$15.31	
France	3 2	to 3 3	15.07 to 15.31	
Luxemburg	3 2	to 3 3	15.07 to 15.31	
Basic pig iron:(a)				
Belgium	3 1	to 3 2	14.82 to 15.07	
France	3 1	to 3 2	14.82 to 15.07	
Luxemburg	3 1	to 3 2	14.82 to 15.07	
Billets:				
Belgium	4 17 1/2		23.69	
France	4 17 1/2		23.69	
Merchant bars:				C. per Lb.
Belgium	5 9		1.18	
Luxemburg	5 9		1.18	
France	5 9		1.18	
Joists (beams):				
Belgium	5 5		1.14	
Luxemburg	5 5		1.14	
France	5 5		1.14	
Angles:				
Belgium	5 18 1/2	to 6 0	1.28 to 1.30	
1/2-in. plates:				
Belgium	6 10		1.41	
Germany	6 10		1.41	
3/8-in. ship plates:				
Luxemburg	6 10		1.41	
Belgium	6 10		1.41	

(a) Nominal.

tage is an open question. Some powerful groups have put their case before the Government and it remains to be seen whether the latter is prepared to set up a committee of investigation. In view of the protection leanings of the authorities in power, however, some kind of an impost is probable.

In the meantime stocks of pig iron at makers' yards are increasing and prices are falling, No. 3 Cleveland, g.m.b., being not more than 73s. (\$17.74), while East Coast hematite can be had freely at 78s. (\$18.95). Steel prices are quotably unaltered, but are really a matter of negotiations. Some home departments are busy, such as railroad material, rails, etc., and some structural and engineering departments.

DISORGANIZED BY STRIKE

Belgian Makers Largely Out of Market—Heavy Competition from Lorraine and Luxemburg

ANTWERP, BELGIUM, June 17.—More than ever the tendency of the market cannot be determined. It is entirely disconcerted by sudden changes of foreign moneys and with the strike in the Charleroi and Center districts. Blast furnaces in these districts are all stopped. All big works have closed down. Several makers have transferred part of their unfinished orders to other works, in the Liege district or Luxemburg.

Exporters also have to effect replacing of orders. This causes, of course, a fictitious movement in the trade, so that the situation is entirely strained. New orders for export are scarce. In fact, business becomes more and more difficult. Buyers continue to push for lower quotations and Belgian makers abstain mostly from booking. But Luxemburg and Lorraine works, most probably short of orders, accept further concessions of prices. That is why, notwithstanding the strike and higher exchange, the market as a whole shows weak and quotations give way, notably in certain cases.

Finished Steel.—All makers of the districts where workpeople went out on strike have retired from the market. The other works no longer quote, as they got a good deal of work by the replacing of orders. The strike, which seems to increase, has of course affected especially this department. Weakness prevails. French makers appear to be especially avid of orders and therefore lower their prices on our markets on a larger scale. But new business is more than scarce.

Prices asked differ much. Belgian makers maintain bars at 112s. or perhaps 111s. (1.21c. or 1.20c. per lb.) f.o.b. Antwerp. French works quote lower and would certainly book at 109s. to 110s. (1.18c. to 1.19c.). Business in most cases could not develop, as offers made by export buyers were as low as 107s. 6d., or even 105s. (1.16c. or 1.14c.) f.o.b. export harbor.

Rods are somewhat firmer. The demand for this commodity is larger than usual. On the other hand, prices for wire rods gave way to 116s. (28.20) f.o.b. Antwerp against 122s. (\$29.65) a fortnight ago.

Beams are quoted about 106s. to 107s. (1.15c. to 1.16c. per lb.), but weakness prevails largely in this line. Furthermore, Luxemburg and Lorraine competition appears strong at a lower price (105s., or 1.14c., was reported).

Prices, mostly nominal, were approximately as follows, in francs per metric ton, with American equivalents:

	Fr.	Per Lb.
Bars	570 or \$27.25 or 1.24c.	
Beams	540 or 25.45 or 1.15c.	
Rods	630 or 30.00 or 1.36c.	
Corrugated bars	620 or 29.30 or 1.33c.	
Steel hoops	725 or 34.50 or 1.56c.	
Cold rolled hoops	1,025 or 51.00 or 2.31c.	
Drawn steel, squares	925 or 44.00 or 2.00c.	
Drawn steel, rounds	900 or 42.85 or 1.94c.	
Drawn steel, hexagons	1,000 or 48.00 or 2.20c.	
Spring steel	1,020 or 48.60 or 2.18c.	
Rails	600 or 28.75	
Wire rods	600 or 28.75	

Sheets.—Material is available in large quantities. Heavy sheets, which were lately £6 14s. (1.45c. per lb.),

Speaking recently, at a meeting of the Committee on Industry and Trade, C. N. Goodall, on behalf of the Locomotive Manufacturers' Association said that the condition of the industry could be regarded only as desperate. The main factors that had brought about this state of things were: The world-wide increase in the productive capacity at present devoted to locomotives; inadequacy of available markets to absorb such production; consequent ruthless competition, both internal and foreign, which in this country was rapidly exhausting the capital resources of the establishments engaged in locomotive manufacture; high costs of production in this country and the absence of support from home railroads.

fell as low as £5 12s. (1.21c.), forced by the strong French competition. Only the ¼-in. sheets maintained better prices. Quoted prices are:

	Fr.	Per Lb.
Thomas sheets 0.5 mm. (No. 26 gage)	1,130 or \$53.80 or 2.44c.	
Thomas sheets 1 mm. (No. 20 gage)	975 or 46.45 or 2.11c.	
Thomas sheets 2 mm. (No. 14 gage)	860 or 41.00 or 1.86c.	
Thomas sheets 3 mm. (No. 11½ gage)	720 or 34.30 or 1.56c.	
Thomas sheets 5 mm. (No. 6½ gage)	670 or 31.90 or 1.45c.	
Galvanized sheets 0.5 mm.	2,300 or 109.50 or 4.97c.	
Galvanized sheets 1 mm.	1,725 or 82.15 or 3.73c.	
Polished sheets, average price	1,450 or 69.00 or 3.13c.	

Iron.—Business is mostly scarce. No. 4 quality, only, is not available in quantity and therefore shows good prices. The other qualities are per contra very weak. Basis prices in these circumstances ran 111s. to 112s. 6d. (\$26.97 to \$27.33) per ton f.o.b. Antwerp, but with not lower than 140s. (\$34) for the No. 4 grade.

Blooms, Billets and Slabs.—Billets remain scarce and well sought by domestic re-rollers. Quotations are maintained at 100s. or even 101s. (\$24.30 or \$24.54), a price which is too high for export. This favorable situation is maintained because neither Lorraine nor Luxemburg makers are on our market.

Blooms are much weaker. Prices went down to 95s. (\$23.08) in some cases. The general quotation of 97s. to 97s. 6d. (\$23.57 to \$23.69) f.o.b. Antwerp did not result in business. English buyers, the most important for this class of material, offer no more than 90s. (\$21.87).

The situation for larges (sheet bars) is the same as for billets. Prices are strong and quantities available small. Quotations are 104s. and 105s. (\$25.26 and \$25.50), but 102s. to 103s. (\$24.76 to \$25) for Luxemburg material.

Pig Iron.—Quotations for foundry pig iron remain the same. The higher rates of exchange have not caused the expected increase of prices, a proof that this market is far from firm. Demands from abroad are smaller and prices offered lower. Phosphoric foundry No. 3 is quoted 340 and 345 fr. f.o.b. Antwerp, i. e., \$16.45. Semi-phosphoric grade is also cheap—about 76s. to 78s. (\$18.50 to \$19) f.o.b. Antwerp, for first qualities.

Half Billion Dollars in Canadian Steel Industry

Last year in Canada there were 1004 companies engaged in the manufacture of iron and steel and their products, according to a preliminary statement issued by the Dominion Bureau of Statistics, at Ottawa, Canada. These plants represent a total capital investment of over \$535,539,800. They employed 78,240 persons last year to whom they paid over \$99,600,000 in wages and salaries.

Imports of iron and steel and their products into Canada last year are given as being valued at \$137,979,471 as compared with \$173,720,299 in 1923. Of the 1924 total 85 per cent was obtained from the United States and 12.8 per cent from Great Britain. Exports of iron and steel from Canada last year dropped 12.6 per cent from the previous year to \$58,621,000. New Zealand provided the best market, taking about 14 per cent, with the Argentine 13.6 per cent, Great Britain about 13.3 per cent, Australia 12.5 per cent and the United States 10 per cent.

METAL WORKING IN OHIO

Steel Works, Rolling Mills, Furnaces, Machine Shops, Report on Output and Wages

Production value of the output of goods, of 81 reporting steel works and rolling mills in Ohio, in 1923, was \$709,182,753, as against 85 reporting steel works and rolling mills with products valued at \$33,561,609, in 1921, according to the Bureau of the Census. The operation of steel works and rolling mills, the reports point out, is the leading industry in Ohio, whether measured by number of wage earners or by value of products. The average number of wage earners in this industry in 1923 showed an increase of 76.3 per cent over 1921, while the value of products showed an increase of 112.6 per cent. Wages paid in 1923 totaled \$152,418,262, distributed among an average number of 87,032 wage earners, as against \$71,577,748 for an average of 49,364 wage earners in 1921. The average pay was \$1,751 for the year 1923, and \$1,450 for 1921.

For 38 reporting blast furnace plants in Ohio, in 1923, the value of products was \$231,339,781, while wages amounted to \$14,376,319, and the average number of employees was 7796. These figures compare with 30 reporting blast furnace plants in 1921, whose products were valued at \$94,506,093, while wages paid aggregated \$6,915,607 and the average number of employees was 4111.

Products of 95 machine tool plants in Ohio in 1923 were valued at \$36,423,371, while wages paid were \$13,209,483, and the average number of employees was 9220. In 1921, the reporting 98 plants making machine tools showed the value of their products to be \$19,399,794, while wages paid were \$6,530,357, and the average number of employees was 5593.

The value of products of 877 Ohio foundry and machine shop establishments, in 1923, amounted to \$338,168,025, wages having amounted to \$95,657,099, while the average number of wage earners was 65,259. In 1921 the value of products of 891 foundries and machine shops was \$198,644,762, wages having amounted to \$51,351,534, and the average number of wage earners was 40,301.

The value of products of 195 plants in Ohio making electrical machinery and apparatus and supplies, in 1923, was \$174,329,350, wages having been \$32,550,483, and the average number of employees was 26,300. The value of products of 161 of these establishments in Ohio, in 1921, was \$102,814,480, wages

paid having been \$17,002,951, while the average number of employees was 14,873.

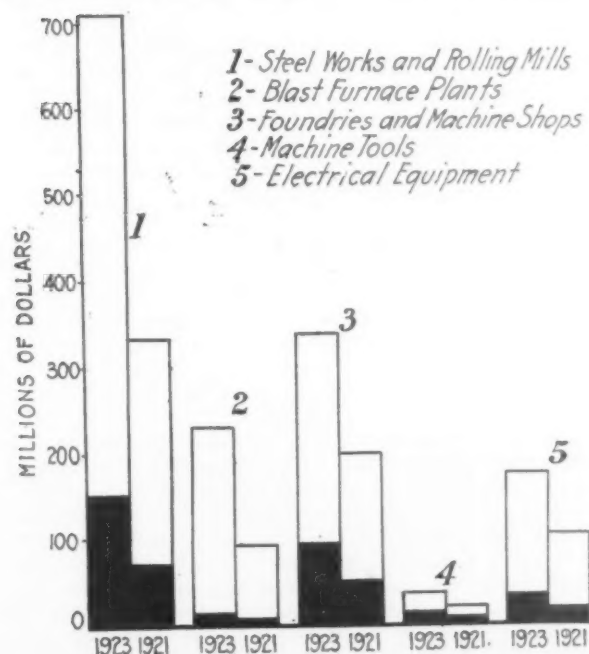
Grouping the five classes of metal-working manufacturing covered in the preceding paragraphs into a table, we find a total of 1286 establishments in 1923 against 1265 in 1921. Production in 1923 aggregated \$1,489,442,000 or almost precisely twice the total of \$748,927,000 in 1921. The wage total of 1923 at \$308,210,000 was a little more than double the 1921 total of \$153,379,000. The number of wage earners in 1923 was 195,607, or 78 per cent greater than the 114,242 of 1921. Average wages amounted to \$1,575 in 1923, against \$1,342 in 1921.

Analysis of the 1923 returns shows great divergence among the different groups in the matter of the relation of wages to total value of products. For instance, the wages in the steel works and rolling mills amounted to 21.5 per cent of the total value of goods produced. In the blast furnace plants, however, a much lower ratio was found, with only 6.21 per cent of total value of products expended for wages.

On the other hand, in the machine tool industry the wage bill was relatively large, having been 36.3 per cent of the value of products. It will be noted in the table that the total wages paid in the machine tool industry were nearly as great as in the blast furnace plants, while the value of output of the latter was more than six times that of the machine tool plants. This reflects, of course, the large amount of labor put on the finished products. Somewhat these same conditions obtain in the foundry and machine shops, where the wage bill amounted to 28.3 per cent of the total value of products.

Copper in 1924

Final statistics of the production of copper in the United States in 1924 have been issued by the Department of the Interior as compiled by H. M. Meyer, of the U. S. Geological Survey. The total production of new refined copper last year was 2,260,076,010 lb., which compares with 1,979,835,616 lb. in 1923. The smelter production of primary copper from domestic sources last year amounted to 1,634,249,192 lb., an increase of about 14 per cent over 1923. Stocks of refined copper on Jan. 1, 1925, are reported to have been 243,000,000 lb. as compared with 264,000,000 on Jan. 1, 1924. The consumption of new refined copper in the United States last year as represented by metal withdrawn from the total year's supply on domestic account was 1,354,742,564 lb. as compared with 1,300,473,331 lb. in 1923.



In Thousands					
	Number	Prod-ucts	Wage Total	Wage Earners	Aver-age Wage
1923					
Steel works and rolling mills	81	\$709,183	\$152,418	87,032	\$1,751
Blast furnace plants	38	231,339	14,376	7,796	1,844
Machine tool makers	95	36,423	13,209	9,220	1,433
Foundries and machine shops	877	338,168	95,657	65,259	1,466
Electrical equipment	195	174,329	32,550	26,300	1,239
Total	1,286	\$1,489,442	\$308,210	195,607	\$1,575
1921					
Steel works and rolling mills	85	\$333,562	\$71,578	49,364	\$1,450
Blast furnace plants	30	94,506	6,916	4,111	1,682
Machine tool makers	98	19,400	6,530	5,593	1,168
Foundries and machine shops	891	198,645	51,352	40,301	1,274
Electrical equipment	161	102,814	17,003	14,873	1,143
Total	1,265	\$748,927	\$153,379	114,242	\$1,342

In the Diagram, the Total Height of Column Shows the Value of Products for Each of the Five Classes of Manufacture, in 1923 and in 1921. The black area at bottom represents, to the same scale, the several amounts of wages paid. The striking contrast in output between machine tool plants and blast furnaces, with wages nearly the same, will be noted.

Surface Cracks in Rolling Steel

(Continued from page 77)

heating and rolling, aided perhaps by adequate chipping, which, however, ought not to be required.

Cracks due to redshortness, when they occur, are usually located rather regularly throughout the ingot surface as it is rolled, though sometimes they are larger and more numerous in the upper part than in the lower. When they do appear in the lower part, they are not always easily distinguished from snakes. When they are not wholly rolled out but persist in the bloom, they have rough granular surfaces within where the metal has been torn apart and from that and their somewhat regular locations are to be identified as due to redshortness.

Sometimes the first ingots of a heat to be cast will be cracked more than those cast later indicating that more time should have been allowed between the addition of the finishing alloys and teeming which would have improved the quality of the steel. The ingot butt made of the last of the heat to be cast, already referred to, which proverbially rolls well, illustrates this point.

6. Burning or Overheating

Cracks caused in rolling burnt steel resemble so much those in overheated steel that they may properly be considered together even though the one is due fundamentally to excessive action of oxygen and the other to excessive heat. Steels vary much in their ability to endure without harm unduly high or even proper temperatures and length of time in the heating furnace, those of better quality resisting damage better than those somewhat redshort.

The cracking or breaking tendency from too much fire is probably due to the excessive softening or breaking down of the interfacial matter which allows the grains of the burnt or overheated steel to be separated by the hot-working operation. Some of the grains may then fall out of the cracks while the metal exposed within may be seen to be made up of grains more or less loosened and so detached from the bloom.

The ingot may be partly, or, in exceptional cases, wholly affected. Usually, however, the damage is done on a part of a corner or side where, due to some defect in or bad working of the heating furnace, the ingot is heated hotter or oxidized more deeply than elsewhere because, it may be, the flame has impinged improperly on that part. These cracks resemble those due to redshortness, the broken surfaces being granular within but their irregular location in the bloom will usually serve to distinguish them from those due to redshortness which, as already noted, are located more regularly in the ingot. They may be of any size and in any number according to the severity of the case.

7. Dendrites

Cracks due to dendrites do not exist in the ingot but, when they occur, are developed in the steel by the hot-working operation when the coherence of the interfacial metal between the grains or "chill" dendrites is much less than that of the metal in the grains themselves at the hot-working temperature. The dendrites are elongated, interfering crystals which form during solidification around the outer parts of the ingot, with their longer axes perpendicular to the mold wall and give the ingot the so-called columnar structure, visible when the ingot is broken across.

Dendritic cracks bear some resemblance to cracks from redshortness and, when near the bottom of the ingot, to snakes, but may and do sometimes occur in high quality steels which are well-made and free from harmful amounts of oxides. They do not often if ever occur in low carbon steels, say with less than 0.30 per cent of carbon and not at all in effervescing steels as the agitation or churning of the metal in the molds prevents the crystalline growth which causes them.

The larger the dendrites, which in killed steel may reach a length of 1 or even 2 in., the more likelihood of these cracks being formed when the ingot is rolled. The size of the dendrites depends somewhat on the

size of the ingot but more on the casting temperature: The hotter the steel and the thicker the ingot, the longer and larger they will be because of the longer time afforded them for forming before complete solidification of the practically motionless steel. The larger they are, the richer the intergranular metal, which is the last of the mother liquor to solidify, will be in non-ferrous elements, particularly carbon, sulphur, phosphorus and oxygen.

Because of the greater concentrations of these elements in the joint-metal, it may not endure without damage a proper working temperature but will be unbearably softened and weakened by the heat. When, therefore, one of these cracks occurs it follows the intergranular layers. A snake is in one sense a dendritic crack for when it occurs it is likely to follow the contacting surfaces of the grains or dendrites if present, but it occurs in the ingot while a true dendritic crack does not.

Dendritic cracks may be accentuated in ingots having sharp or but slightly rounded corners. The dendrites on each side then interfere at the corners with those on the adjacent sides resulting in "planes" of weakness, each one located so as to bisect the angle of the corner along which planes the metal is likely to be cracked when hot-worked. This may happen with an ingot of square, hexagon or octagon cross-section. Hence the corners of all killed or nearly killed steel ingots should be well rounded with a radius of two or more inches. The larger the ingot the greater the radius.

To minimize dendrites and thereby the cracks due to them, accelerated solidification of the steel in the molds, as by items 1, 3, 4, 5, 8 and 9, suggested for minimizing snakes, may be employed. [See THE IRON AGE, June 25.]

8. Skinholes

Cracks, (so-called) due to skinholes are really tears running from hole to hole which look much like cracks which name is usually, though incorrectly, applied to them. When they occur, the gasholes which cause them are numerous and close together; in extreme cases the metal is completely honey-combed by them.

Killed steel of course does not have them. In partly killed steel the skinholes if present are due to either (1) inadequate boil during the working or decarburizing period; (2) too strong boil at the end which shows the presence of too much oxygen in the metal and slag; (3) insufficiency of gas-solvents added, or (4) too high casting temperature.

In steel intended to effervesce any skinholes present are there because of either (1) inadequate boil during the working period and also at the end before the final additions, which condition is usually due to too little oxide of iron present in the metal and slag or too high temperature, one or both, or (2) to too high casting temperature. The latter is the usual cause.

Skinholes such as cause tears on the sides of the ingot in the roll pass are likely to cause seams on the surface on which the rolls actually press and will do so if the skin of the metal over them is so thin as to be burnt through in the heating furnace.

A crack or tear due to skinholes may often be recognized as such in large blooms, not less than 6 in. sq., which have not received enough work to destroy the evidence, by examination of the surfaces within. Remains of the holes may be seen while, if the crack be due to redshortness or overheating, the broken surfaces will be rough or granular as has been already explained.

9. Tears

Cracks from stretching without work may occur in commercially sound steel. A notable case of this kind arose in the past from making low-carbon slab ingots having their narrow sides semi-cylindrical and therefore without corners. When such an ingot was rolled into a plate, the metal on the protruding rounded edges was stretched, as the plate was formed by the rolls, without being worked itself, and was likely to be torn apart in one or more places even though the steel was of fair quality. If the steel was in any way defective

or inferior, the tears were correspondingly more numerous and larger. So the vertical sides of an ingot in the blooming mill pass are stretched without work and therefore liable to be pulled apart or cracked, but the cleaner and better the steel the less likely is this to happen.

In a general way the tendency of an ingot to crack in the rolls is increased by unduly heavy draft in the first passes and *vice versa* by lighter draft. This, as will readily be understood, is due to the improved ductility of the metal imparted by moderate hot-working given it before it is greatly stretched. In diagnosing a case of cracks and prescribing a cure, this feature must be taken into consideration.

A crack may be of any degree of importance from one which may be obliterated by heating and hot-working, to one which may be chipped out so that the piece is usable, or to one which condemns the piece as scrap. Any crack or break which appears in an ingot when it is rolled is a defect. Steel of the best quality does not have cracks but "tonnage" steel is rarely free from them.

Each case of ingot-cracking should be diagnosed separately to determine the cause or combination of causes, and the step or steps to be prescribed to prevent or limit cracks in the future. A cure must be applied understandingly or other ills may be developed or increased.

GREAT BRITAIN LEADS

Iron and Steel Exports More Than Double Those of United States, in First Quarter

WASHINGTON, June 27.—Exports of iron and steel from the United States during the first quarter of 1925 amounted to only 42 per cent of similar exports for the same period from Great Britain, but sales of the American products exceeded those of British goods in several important foreign markets, including Canada, Japan, Mexico and Cuba, according to a statement issued by the Iron and Steel Division, Department of Commerce. The principal foreign markets for British iron and steel were India and Ceylon, Australia, British South Africa, the United States and New Zealand, in the order named.

The following table gives the comparative strength of the two countries in their more important world markets for iron and steel during the first three months of the current year:

Countries of Destination	From United States		From United Kingdom	
	Gross Tons	Per Cent	Gross Tons	Per Cent
Europe:				
Belgium	1,865	0.5	32,080	3.4
Denmark	154	...	11,296	1.2
France	1,312	0.3	20,821	2.2
Germany	318	...	14,700	1.6
Italy	3,680	0.9	30,358	3.2
Netherlands	503	...	23,728	2.5
Norway	878	0.3	12,965	1.4
Spain	1,121	0.3	9,301	1.0
United Kingdom	12,114	3.0	...	...
America:				
Argentina	43,858	11.0	55,590	6.0
Brazil	9,705	2.5	10,562	1.1
Chile	7,521	1.9	4,780	0.5
Cuba	25,517	6.5	(*)	(*)
Mexico	29,621	7.5	(*)	(*)
Other South and Central America	23,263	6.0	5,973	0.7
Canada	127,719	32.1	17,712	1.9
United States .....	...	...	45,202	4.8
Africa and Adjacent Asia:				
British East Africa .....	...	...	10,225	1.1
British South Africa	15,231	3.8	53,589	5.7
British West Africa	35	...	9,524	1.0
Egypt and Palestine	1,155	0.3	7,111	0.8
Far East:				
Australia	5,621	1.4	105,370	11.3
China	7,565	1.9	13,354	1.4
India and Ceylon	6,248	1.6	159,651	17.0
Japan	31,399	8.0	28,174	3.0
New Zealand	423	0.1	44,516	4.8
Straits Settlements	1,151	0.3	9,863	1.1
All other countries and non-allocated	39,620	9.8	199,851	21.3
Total	397,597	100.0	936,306	100.0

(*) Not shown.

British Cast Iron Research

The council of the British Cast Iron Research Association has recently extended the research program by arranging for an investigation on the influence of silicon, manganese and phosphorus on the formation of graphite in cast iron, to be conducted by M. L. Becker, at the University of Manchester under the supervision of Prof. F. C. Thompson, and for an investigation to be commenced at the National Physical Laboratory under the supervision of Dr. W. Rosenhain, on the alloy systems: iron-silicon, iron-manganese, iron-phosphorus in the presence of carbon over the range usually associated with cast iron. It is anticipated that these fundamental investigations will yield in-

formation of great value in connection with other investigations in hand.

At a recent meeting of members it was decided that the maximum annual subscription should be reduced to 100 guineas per annum. The minimum is at present five guineas per annum for the smallest foundries, and varies with the size of the foundry concerned.

The director and consultant of the association are now visiting Continental laboratories and works for the purpose of examining recent foundry developments, particularly in Germany.

American Car and Foundry Net for Year \$6,164,103

Net income of the American Car & Foundry Co. for the year ended April 30 was \$6,164,103, after charges and Federal taxes. This compares with \$6,304,967 in the preceding year. Profit and loss surplus totaled \$37,742,569, compared with \$37,278,466 in the previous year. Assets aggregated \$125,728,322, including \$73,289,438 in property and plant, \$14,085,864 in Government securities and \$7,696,678 in cash. Assets at the end of the previous year totaled \$124,316,968.

President W. H. Woodin said in his report: "The buying of new equipment by the railroads during the year has been intermittent rather than steady. The rebuilding and repairing of old equipment have been appreciably less in volume than in previous years. The company enters upon its new year with a fair amount of business on its books. It may reasonably be expected that before the close of the year buying by the railroads will be resumed in increased volume."

Corrosion of Outdoor Equipment

Protection of oil and gas field equipment against corrosion forms the subject of a book of 134 pages, issued by the United States Bureau of Mines as Bulletin No. 233. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, at 35c. each.

While the details of the bulletin are based upon the one limited field of activity, the principles involved affect all outdoor structures of iron and steel. Nearly half of the book is devoted to methods of combating corrosion under the varying circumstances of use. It is stated that no panacea for corrosion troubles has yet been found, but that excessive losses from this source can be diminished by systematic effort. A list of recommendations follows, for use in a series of conditions of application.

The New York State Department of Education offers scholarships of \$1,000 each to trade and technically trained men and women who desire to prepare for teaching. Those selected will be licensed to teach in the schools of the State, after completing a one-year resident teacher-training course to be given at the State Normal School in Buffalo. Persons interested should address the Division of Vocational and Extension Education, State Department of Education, Albany, N. Y.

MACHINERY EXPORTS

May and Eleven Months' Total Show Gain Over Last Year—Imports Greater

WASHINGTON, June 27.—Reflecting a loss of nearly \$4,000,000, or approximately 11 per cent, exports of machinery in May, 1925, were valued at \$32,164,865, as against \$36,033,980 in April. A substantial gain is shown when the total for May of this year is compared with the total for the corresponding month of last year, which was \$29,024,078. For the 11 months ended with May of this year machinery exports were valued at \$309,976,724, as against \$290,030,079 for the corresponding period one year ago.

Imports of machinery in May, 1925, were valued at \$861,655, a sharp decline under April, when they were valued at \$1,167,099. For the 11 months ended with May of the current year imports were valued at \$9,468,750 and represented a heavy increase over imports for the corresponding period of last year, when they were valued at \$8,537,690.

Exports of machine tools in May showed an increase in number but a slight decline in value when compared with those for April. The May exports totaled 5423 in number, valued at \$1,230,914, as against 4775, valued at \$1,245,634, in April.

Of the May shipments of locomotives those going to Chile were valued at \$259,133, while for the 11 months American locomotives exported to Chile were valued at \$471,811. Locomotives shipped to Canada in May were valued at \$68,169, and for the 11 months were valued at \$295,723.

The Philippine Islands formed the most important buyer of exports of sewing machines in May, taking shipments to the value of \$157,376, while for the 11 months they were valued at \$640,745. Exports of sewing machines to the United Kingdom in May, and for the 11 months ended with May, were valued at \$100,-

564, and \$1,545,859 respectively. Shipments of sewing machines to Brazil in May and during the 11 months were valued at \$76,066 and \$435,522 respectively, while shipments of this class to Mexico for the two periods were valued at \$52,668 and \$1,140,574 respectively.

Exports of typewriters to the United Kingdom in May and during the 11 months ended with that month were valued at \$296,652 and \$2,918,410, while values for the corresponding periods, of shipments of typewriters to Italy, were \$138,676 and \$907,906. Similar shipments to France were valued at \$138,310 and \$1,-647,808.

The United Kingdom was the principal destination of foreign shipments of printing presses in May, the value being \$111,269, while for the 11 months the value was \$1,229,720. China came second, taking printing presses to the value of \$54,571 in May, while for the 11 months they were valued at \$60,983. France was the principal destination of exports of harvesters and binders in May, the value being \$356,871, while for the 11 months the value was \$1,771,941. Harvesters and binders shipped to Denmark in May were valued at \$48,717, and for the 11 months at \$505,623.

Imports of Machinery into the United States

	(By Value)		Eleven Months Ended May	
	May 1925	May 1924	1925	1924
Metal-working machine tools	\$45,369	\$33,200	\$293,472	\$362,110
Agricultural machinery and implements	270,855	270,196	2,636,398	2,306,583
Electrical machinery and apparatus	68,035	33,463	1,374,282	375,471
Other power generating machinery	69	509	14,249	78,271
Other machinery	305,355	289,118	3,645,377	3,171,729
Vehicles except agricultural	171,972	170,139	1,504,972	2,243,526
Total	\$861,655	\$796,625	\$9,468,750	\$8,537,690

United States Metal-Working Machinery Exports

Machinery Exports from the United States (By Value)

	May, 1925	May, 1924	Eleven Months Ended May, 1925	May, 1924
Locomotives	\$504,573	\$278,014	\$6,492,156	\$3,641,610
Other Steam Engines	126,333	4,484	1,391,886	423,518
Boilers	118,192	158,520	1,810,044	1,738,039
Accessories and Parts	159,981	315,796	1,761,904	3,820,057
Automobile Engines	1,821,612	244,715	10,327,282	3,844,118
Other Internal Combustion Engines	763,650	603,676	6,954,880	5,787,964
Accessories and Parts for	405,969	311,445	3,202,943	3,394,253
Electric Locomotives	43,329	150,989	1,426,897	1,822,950
Other Electric Machinery and Apparatus	546,665	668,663	6,595,455	8,373,004
Excavating Machinery	447,781	204,379	2,231,333	1,634,289
Concrete Mixers	66,007	60,036	620,802	550,952
Road Making Machinery	155,088	174,141	1,154,622	1,049,254
Elevators and Elevator Machinery	188,657	244,636	1,834,756	1,959,160
Mining and Quarrying Machinery	836,686	840,660	8,051,423	9,851,038
Oil Well Machinery	946,421	592,212	7,197,869	6,604,289
Pumps	664,968	563,942	6,430,525	6,991,822
Lathes	233,923	78,171	1,626,006	1,156,349
Boring and Drilling Machines	41,344	62,879	690,448	168,177
Planers, Shapers and Slotters	33,010	29,303	439,668	250,160
Bending and Power Presses	50,448	46,571	715,342	408,577
Gear Cutters	40,797	19,288	538,575	337,140
Milling Machines	193,176	25,676	1,140,298	386,612
Thread Cutting and Screw Machines	113,944	29,759	709,697	575,060
Punching and Shearing Machines	38,686	3,171	164,044	122,226
Power Hammers	9,983	16,950	214,943	165,043
Sharpening and Grinding Machines	329,656	161,931	2,357,411	1,137,938
Other Metal Working Machinery and Parts of	479,530	324,878	4,249,142	4,067,428
Textile Machinery	733,207	930,141	8,774,130	7,975,417
Sewing Machines	792,029	944,582	7,313,844	9,462,575
Shoe Machinery	129,960	110,894	1,428,688	1,152,489
Flour-Mill and Gristmill Machinery	68,262	74,771	696,581	1,038,758
Sugar-mill Machinery	405,191	216,968	8,459,197	6,218,496
Paper and Pulp Mill Machinery	120,064	134,082	1,470,296	1,781,590
Sawmill Machinery	40,305	34,312	704,830	558,265
Other Woodworking Machinery	127,282	108,632	1,249,094	1,187,716
Refrigerating and Ice Making Machinery	422,212	179,976	1,841,948	1,120,011
Air Compressors	387,606	286,570	3,050,318	2,747,046
Typewriters	1,541,796	1,293,611	15,259,188	13,295,027
Power Laundry Machinery	102,982	144,184	940,631	938,770
Typesetting Machines	232,225	332,574	3,123,481	3,716,860
Printing Presses	450,212	435,304	4,805,533	4,526,217
Agricultural Machinery and Implements	6,002,438	6,965,430	57,344,503	56,182,801
All Other Machinery and Parts	11,148,675	10,617,162	112,314,111	107,439,005
Total	\$32,164,865	\$29,024,078	\$309,976,724	\$290,030,079

	May, 1925		April, 1925	
	Number	Value	Number	Value
Lathes	144	\$233,923	127	\$203,730
Boring and drilling machines	146	41,344	121	89,784
Planers, shapers and slotters	21	33,010	26	33,215
Bending and power presses	27	50,448	23	45,162
Gear cutters	10	40,797	116	70,017
Milling machines	98	193,176	64	124,901
Thread-cutting and screw machines	89	113,944	96	140,241
Punching and shearing machines	16	38,686	24	18,009
Power hammers	20	9,983	18	15,402
Sharpening and grinding machines	197	339,656	232	377,953
Chucks, centering, lathe, drill and other metal-working tools	3,065	32,797	2,598	39,210
Pneumatic portable tools	1,590	103,150	1,330	88,019
Total	5,423	\$1,230,914	4,775	\$1,245,634

Finds Production Costs High in Japan

Japanese labor is not as efficient as American, states F. W. Shackelton, who returned last week after spending six years in Japan as the operating manager of the Japanese plant of the Truscon Steel Co., Youngstown, Ohio. It is unlikely Mr. Shackelton will return to Japan. While the Japs do their work well, several of them are required to do the work which one American could perform, he states. Accordingly, even though individual labor rates are less in Japan than in this country, production costs are higher.

Owing to the demand for stronger buildings following the earthquakes, Mr. Shackelton states the requirements for reinforcing steel are increasing. At present, business in Nippon is somewhat depressed because of financial stringency.

Bituminous coal as generator fuel for large water-gas sets with waste-heat boilers forms the subject of technical paper 335, issued by the United States Bureau of Mines. It is pointed out that the use of this fuel is not so successful, under the conditions mentioned, as in sets of smaller size. Copies of the publication may be obtained at 15 cents each from the Superintendent of Documents, Government Printing Office, Washington.

NEW TRADE PUBLICATIONS

Automatic Plate Valves.—Mesta Machine Co., Pittsburgh. Bulletin D of 16 pages describes automatic plate valves made under the Iversen patents for use in blowing engines and air compressors and for other purposes, such as vacuum pumps and gas compressors. The bulletin is thoroughly illustrated, showing details of the valves and their application, and with diagrams showing performance under various conditions.

Horizontal Cross-Drum Boiler.—Wickes Boiler Co., Saginaw, Mich. Eight-page folder describing the Wickes horizontal cross-drum boiler with its single jointed header and straight tubes. It is pointed out that simplicity of design facilitates constructing this boiler for high steam pressures.

Air and Gas Scrubber.—D. J. Murray Mfg. Co., Wausau, Wis. A 20-page bulletin with diagrams and photographic illustrations is devoted to the machine designed by E. M. Bassler for the cleansing of air and gases in industrial processes.

Acetylene Gas Apparatus.—An error was made in THE IRON AGE of June 11 in the heading relating to two booklets published by the Alexander Milburn Co., Baltimore. The heading read "Electric Apparatus" instead of "Acetylene Gas Apparatus." The Milburn company makes no electric equipment. The two booklets described the Milburn light designed for the simplification of illumination required for outside construction at night, and also the Milburn welding and cutting apparatus and the Milburn generators and auxiliary equipment.

Safety Slings.—Murray Safety Sling Co., 40 Water Street, Pittsburgh. A 4-page booklet, illustrated, and describing various types of safety slings for use in industrial plants.

Twist Drills.—Detroit Twist Drill Co., Detroit. Booklet entitled "The Drill for Today" gives the technical reasons for the design and method of manufacture of Detroit drills.

Electrical Recording Instruments.—The Bristol Co., Waterbury, Conn. Bulletin No. 332 describes some of the latest developments in Bristol's electrical recording instruments. This bulletin supplements catalog No. 1501.

Gear Speed Reducers.—The Falk Corporation, Milwaukee. Bulletin No. 38 describes the Falk herringbone gear speed reducers which are especially adapted to conveying and elevating machinery used in handling materials in process of manufacture. Illustrations show the application of this gear speed reducer to various types of machines.

Steel Sash.—David Lupton's Sons Co., Philadelphia. A 48-page illustrated booklet showing the use of Lupton's pivoted sash on various types of industrial buildings. Detailed information of value to the engineer and architect is also given.

Twist Drills.—Cleveland Twist Drill Co., Cleveland. Catalog No. 41 describes the company's products including several new items such as special drills for bakelite and slate; a new jobbers' carbon drill set; a spiral fluted taper shank taper bridge reamer in high speed steel; taper shank taper bridge reamer and car reamers, both straight and spiral fluted, in "Mezzo" super-carbon steel; a spiral fluted taper pin reamer; three new small sizes of "Quick-Set" adjustable reamers for automotive and machine shop use, together with a special set of these three sizes; a new set of spiral fluted taper pin reamers; a complete new section of mechanical data, containing a wealth of useful information for the shop man. The catalog is 244 pages with stiff paper cover and is thumb indexed.

Automatic Starters for Synchronous Motors.—Electric Machinery Mfg. Co., Minneapolis. Bulletin No. 799 of 20 pages, together with bulletin 785-A of eight pages, are devoted to synchronous motors and their starting devices. Illustrations show details, connection diagrams, the principles of frequency relays, oscillograms, etc.

Electric Thermometers.—Wilson-Macaulen Co., 353 Concord Avenue, New York. Catalog T-2 of 12 pages describes various types of electric thermometers for industrial use and the indicating devices in connection with thermometer work. Resistance bulb thermometers are given special attention, these having ranges from minus 40 deg. Fahr. to 900 deg. Fahr.

Gas Filled Recording Thermometers.—Bristol Co., Waterbury, Conn. Catalog No. 1303 of 56 pages describes recording thermometers for various uses, with many illustrations of the types of instruments and of details of their construction and application. Various charts are shown, together with lists of charts showing the range in degrees covered by each.

Water Softening Equipment.—Graver Corporation, East Chicago, Ind. Bulletin 509 of eight pages deals with the Zeolite water softener and filter. The operation of the equipment is shown, with illustrations. It is designed for various industrial uses, as well as for central stations and laundries and with a small model for household use.

Milling Machines.—The Kempsmith Mfg. Co., Milwaukee, Wis. Condensed Catalog C, describing knee-type all-gear drive maximillers, embracing No. 2, 3, 4 and 5 plain; No. 2 and No. 4 vertical; No. 2, 3, 4 and 5 universal; a three-feed, motor-drive hand miller and a single purpose motor-drive hand miller. Seven sizes of cone pulley drive machines are also described, including No. 1, 2 and 3 plain, No. 1, 2 and 3 universal and a standard hand miller. A single pulley drive production type of machine is presented in two styles, a No. 33 plain and a No. 33 two-spindle machine. In all, 21 different machines are manufactured by the company. The catalog is in condensed form to give a bird's-eye view of the complete line, together with attachments, special milling tools and fixtures. There are 27 illustrations. Size, 32 pages, 4¼ x 9¼ in.

Waterproofing and Dampproofing.—Truseon Laboratories of Detroit. New and revised specifications on waterproofings in a 36-page book, size 8½ x 11 in. The specifications include dampproofing paints, oilproofings and quick-set for concrete.

Gondola Car Dumper.—Link-Belt Co., Chicago, Philadelphia and Indianapolis. Eight-page booklet which describes and illustrates operation and use.

Automatic Oil Burner Bearing.—New Departure Mfg. Co., Bristol, Conn. Two-page folder describing a self-lubricating ball bearing of the vertical axis type used in conjunction with oil heater installations for buildings. The bearings are surrounded by compartments packed with lambs' wool, thoroughly saturated with lubricant.

Rotary Steam Engines.—Baker Motors, Inc., Erie, Pa. Loose-leaf catalog of 20 pages devoted to Rotobaker power units including rotary steam engine, steam generator and oil burner. The engine operates on either high or low-pressure steam. A special design of rotary valve is used. Circulation in the steam generator is said to be rapid.

Describes Line of Rotary Shears

Rotary shears which are claimed to do straight slitting and to cut tapers, outside curves, reverse curves, inside curves, parallel curves and openings in plates, are described and effectively illustrated in a catalog recently published by the Quickworth Co., St. Marys, Ohio. Nine sizes and 30 designs of the machine are offered. The catalog, designated as the No. 80, is made up of 122 pages, 8½ x 11 in.; there are more than 160 illustrations.

The standard shears described range in capacity from 1 in. mild steel for the No. 60A to No. 14 material for the No. 10A machine. Complete specifications are given, and several modified machines of each size are illustrated. The company's adjustable automatic knock-out stop for the cutter head is shown and several pages are devoted to the use of the machines for sign cutting, a hammer for flattening sign panels and letters after cutting, being also described. Among other shears is the No. 8A for trimming ½ in. thick deep drawn steel stampings, and the No. 7A, for trimming deep drawn stampings up to 14 gage. The latter machine may be attached to the wall or a post, or arranged for ceiling mounting. Several pages are devoted to motor-drive arrangements. Instructive information is given on the straight and irregular square edge cutting using the indicating and signalling device, as well as the cutting of openings, reverse curve cutting, trimming of various stampings. The use of the company's slitting and flattening gage is illustrated and the joggling or off-setting the lapped joints between two plates is shown. Beveling from the top with the shear arranged on a tilting base is shown, using the indicating device, and an arrangement for beveling small plates without tilting the shear, using an inclined beveling set, is also pictured. Several attachments are described and illustrated.

Machinery Markets and News of the Works

ACTIVE AT CHICAGO

Railroad List and School List Feature Central West Market

Chicago, Milwaukee & St. Paul Has 56 Items on Its Inquiry, While Board of Education Wants 34 Tools

THE machine tool trade at Chicago has been enlivened by two large lists, one from the Chicago, Milwaukee & St. Paul Railroad embracing 56 items, and the other from the Chicago Board of Education calling for bids on 34 tools. In addition the Milwaukee road has closed for considerable shop equipment inquired for in May, the tools to go to a new shop in St. Paul. The Northern Pacific has bought a few large machines. The Santa Fe has not completed its purchases, but may defer action on the remainder of its list for some

time. Purchases to be made soon by the Burlington may not exceed \$100,000. The Mobile & Ohio list will be bought by the purchasing department of the Southern Railway in Washington and orders may be given out soon. The list totals about \$200,000.

Buying by the automobile industry is not so active as a few weeks ago, according to advices from Detroit and Cleveland, but some orders are being placed. The Chrysler Motors Corporation and the Packard Motor Car Co. have each bought a number of tools in the past week. The Briggs Mfg. Co., Detroit, has divided an order for 65 small presses among several bidders.

While export buying has been largely confined to single tools occasional orders for larger numbers are being received. One of these was for nine turret lathes for Czechoslovakia, the order going to a Cleveland manufacturer.

The Youngstown Sheet & Tube Co. has given out orders for 19 cranes for its new tin mills at Indiana Harbor, Ind.

New York

NEW YORK, July 7.

WITH a week-end holiday, the past week was somewhat quiet in machine tools, but local selling offices closed their books for June with a feeling of satisfaction as business kept pretty well up to the May rate, and May was the best month of the year with many companies. It has been reported that the large pending list of the Mobile & Ohio Railroad will be purchased at the offices of the Southern Railway in Washington through L. H. Skinner of the purchasing department. The General Electric Co. has bought a number of small machines for its West Philadelphia works, among them being a jig borer, a 10-in. vertical shaper, a 6-in. vertical shaper and a 16-in. x 5-ft. engine lathe. The Link-Belt Co., Philadelphia, has purchased a 18-in. crank slotter. The SKP Industries, Inc., New York, bought a 44-in. side-head boring mill and a machine of the same type and size was bought by the Ford Motor Co. The Chicago, Rock Island & Pacific purchased a 4-spindle mud ring drill from an Eastern company.

The Andrews Lead Co., Inc., 36 Greenpoint Avenue, Long Island City, has awarded a general contract to Walter J. Bond, 511 Broadway, Brooklyn, for a three-story addition, 33 x 56 ft., for which plans were drawn by Gregory R. Webb, 10 East Forty-third Street, New York, architect.

Joseph Stolz & Son, Inc., Commerce Avenue, Highbridge, N. Y., structural steel and iron products, has inquired out for a yard crane for handling structural material, also for a portable air compressor.

A one-story vocational machine shop will be erected by the city of New York, Armory Board, Municipal Building, to cost about \$30,000. A general contract has been let to the Balaban-Gordon Co., 116 West Thirty-ninth Street.

The Armstrong Products Corporation, 42 Broadway, New York, is interested in the purchase of mining and other machinery to be installed at the properties of the Phoenix Soapstone Corporation, Maryland Soapstone Corporation and the Virginia-Chesapeake Soapstone Corporation, vicinity of Marriottsville, Md., and Norwood, Va., recently acquired. William P. Benjamin is president.

The Tulp Cup Co., 220 Fifth Avenue, New York, manufacturer of paper cups and containers, has acquired through its president, Simon Bergman, the former plant of the L. W. F. Engineering Co., Eighth Street and Third Avenue, College Point, L. I., manufacturer of airplanes and parts.

It totals 222,000 sq. ft. of floor space and will be occupied in part by the new owner.

H. I. Feldmann, 516 Fifth Avenue, New York, architect, will soon ask bids on general contract for a two-story automobile service, repair and garage building, 75 x 100 ft., to cost about \$95,000.

The Catskill Power Corporation, Nyack, N. Y., recently organized to take over and develop the hydroelectric power properties of the Rockland Light & Power Corporation, Nyack, with which the company will be affiliated, will dispose of a bond issue of \$2,500,000, the proceeds to be used for the purchase of a hydroelectric power plant near Middletown, N. Y., heretofore owned by the Orange County Public Service Co., and for the development of additional hydroelectric power on the Mongaup River. A fund of \$1,200,000 will be used for construction and expansion.

The Staten Island Edison Corporation, St. George, Staten Island, N. Y., is considering the construction of an automatic power substation to cost approximately \$200,000, with equipment. The J. G. White Engineering Corporation, 43 Exchange Place, New York, is engineer.

The National Metal Etching Corporation, room 1709, 42 Broadway, New York, has taken title to property at Long Island City, as a site for a one-story factory, for which plans will soon be drawn. The company was organized recently with a capital of \$125,000.

Louis A. Sheinart, 194 Bowery, New York, architect, has filed plans for a two-story automobile service, repair and garage building, 65 x 200 ft., estimated to cost \$150,000.

The Adirondack Power & Light Corporation, Amsterdam, N. Y., has applied for permission to construct a new steam-electric power plant at Luzerne, Warren County, for which plans will be drawn at an early date, reported to cost in excess of \$80,000.

The Everett W. Cox Co., 8 Foye Place, Jersey City, N. J., operating an automobile agency, has filed plans for new company headquarters, including service, repair and garage building at 22-36 Collard Place, estimated to cost \$140,000. John T. Rowland, Jr., 100 Sip Avenue, is architect.

The Arcione Electro Plating Co., 223 Eighteenth Street, West New York, N. J., has awarded a general contract to R. Rinaldi, 427 Twenty-seventh Street, for its proposed two-story plant, 80 x 100 ft., to cost \$50,000 with equipment. A. De Paola, 106 Eighteenth Street, is architect.

The Jersey Central Power & Light Co., Morristown, N. J., will issue bonds for \$260,000 and stock for \$106,000, a portion of the proceeds to be used for extensions and improvements in power plants and system, including the acquisition of the Millburn Electric Co., Millburn, and proposed expansion in that property.

Harry G. Bach, 63 Schureman Street, New Brunswick, N. J., architect, has plans for a two-story automobile ser-

The Crane Market

NEW inquiry is light for both electric overhead and locomotive cranes. Some of the business that has been pending for several weeks has been placed in the past week but there is still a fair volume of business to be awarded. Recommendations are reported to have been made by the engineering departments on the purchase of one 35-ton gantry crane for the Lehigh Valley Railroad and the 25-ton gantry for the Pennsylvania Railroad. The F. R. Patch Mfg. Co., Rutland, Vt., has purchased a 6-ton crane trolley from an eastern builder.

In addition to the purchase of 19 cranes by the Youngstown Sheet & Tube Co. for its new tin mills at Indiana Harbor, awards are expected in the Pittsburgh district before long on a 10-ton crane by the Vanadium Alloys Steel Co., Latrobe, Pa., and three hand power cranes, a trolley and a bucket handling crane by the Koppers Co., for the new by-product coke plant of the Jones & Laughlin Steel Corporation at Woodlawn, Pa.

Among recent purchases are:

Honolulu Iron Works, 233 Broadway, New York, a 25-ton, 72-ft. span, 3-motor overhead crane from Maris Brothers.

vice, garage and repair building, 60 x 135 ft., to cost close to \$80,000 with equipment.

The National Public Service Corporation, operated by A. E. Fitkin & Co., 165 Broadway, New York, with electric properties in New Jersey, Pennsylvania, North Carolina and other states, has disposed of a new stock issue of \$2,500,000 a portion of the proceeds to be used for extensions and improvements.

The Interstate Machine Corporation, Seventh Avenue and Dow Street, Troy, N. Y., is in the market for two 7½-hp. and one 15-hp. electric motors, 1200 r.p.m., three phase.

The Practical Perfection Engineering Co., Tarrytown, N. Y., contemplates the erection of a plant for manufacturing improved electrical equipment and will be in the market for machinery in the near future.

New England

BOSTON, July 6.

THE most important sales noted the past week were a large hammer to the Boston & Maine Railroad Co. and a 42-in. used lathe to an Everett, Mass., shop. Otherwise, business in machine tools was dull and of small proportion. Joseph Beal & Co., Boston, were low bidders on sheet metal-working equipment required by the city for its Rice, Hugh O'Brien and Damon schools, while Herbert W. Doten, local, was low bidder on electric sheet metal-working benches.

Inquiries are fewer and some of the larger manufacturing industries, which have appropriated funds and given verbal orders, are holding up purchases indefinitely. Local used tool dealers are securing a few sizable inquiries from French machinery dealers for good used metal-working equipment. The inquiry for heavy equipment required by a Connecticut shipbuilding firm is the most important domestic business before the trade. Used machinery dealers state that small concerns inquiring for tools insist dealers must take practically obsolete equipment in part payment.

The metal-working equipment, including numerous plate tools, of the Atlantic Corporation, Portsmouth, N. H., will be disposed of at private sales.

The Thompson Mfg. Co., Waltham, Mass., is asking for new bids on its proposed machine shop.

Plans are being drawn for a \$100,000 ice plant to be erected on Albany Street, Boston, for the Knickerbocker Ice Co., 41 East 42nd Street, New York. C. L. Weir, care of the company, is the architect.

Charles T. Mann, 200 Devonshire Street, Boston, engineer is preparing plans for a factory for the Manufacturing Equipment & Engineering Co. at Framingham, Mass.

Bids close today on a four-story, 80 x 100 ft. addition for the Cambridge Rubber Co., 748 Main Street. J. R. Worcester & Co., 79 Milk Street, Boston, are the engineers.

The Penn Metal Co., Cambridge, Mass., is erecting a new plant at Parkersburg, W. Va., for the manufacture of metal lath, rib lath, cold rolled channels, etc. It will be

Delaware, Lackawanna & Western Railroad, a 15-ton gantry crane from Manning, Maxwell & Moore, Shaw Electric Crane works.

Dwight P. Robinson & Co., New York, a 15-ton hand power crane for the Duquesne Light Co., Pittsburgh, from the Northern Engineering Works.

Fitzgibbons Boiler Co., 47 West Forty-second Street, New York, two 15-ton electric cranes, 52-ft. and 80-ft. spans, from the Northern Engineering Works.

Phoenix Utility Co., 71 Broadway, New York, a 100-ton electric overhead crane from Manning, Maxwell & Moore, Shaw Electric Crane works.

Brooklyn Edison Co., Brooklyn, N. Y., six 10-ton chain blocks for the Hudson Avenue station, from the Wright Mfg. Co.

Youngstown Sheet & Tube Co., Youngstown, eleven 15-ton, five 5-ton and three 10-ton cranes for its Indiana Harbor tin plate plant, from the Morgan Engineering Co.

Chicago, Milwaukee & St. Paul, one electric drop pit table for St. Paul, Minn., shops, from the Whiting Corporation, and a 15-ton electric traveling crane from the Milwaukee Electric Crane & Mfg. Co.

Chicago, Burlington & Quincy, a 10-ton gantry crane, 171-ft. span, with 5-ton auxiliary for the stores department at Aurora, Ill., from the Whiting Corporation.

in full operation late this year and is intended to accelerate shipments west of the Allegheny mountains.

The New England Lime Co., Inc., recently chartered under Delaware laws with capital of \$4,000,000, will take over the properties of the company of the same name with headquarters at Danbury, Conn., and plants at different locations. It plans a stock issue of \$2,350,000, a portion of the proceeds to be used for extensions and equipment. J. K. McLanahan, Hollidaysburg, Pa., is president of the new organization.

The Associated Gas & Electric Co., 61 Broadway, New York, has acquired the Litchfield Electric Light & Power Co., Litchfield, Conn., and plans extensions.

The Barber-Colman Co., Rockford, Ill., manufacturer of milling cutters, hobbing machines and kindred products, has acquired 4½ acres at Framingham, Mass., and plans the early erection of a factory branch, estimated to cost \$50,000. Only a portion of the site will be used at present. The company will remove its present Eastern headquarters at 77 Washington Street, Boston, to the Framingham site.

The Department of State Police, 100 Washington Street, Hartford, Conn., has plans for a one and two-story automobile service, repair and garage building, 50 x 145 ft., estimated to cost \$70,000. Buck & Sheldon, Inc., 60 Prospect Street, are architects and engineers.

Officials of Boutwell, Milne & Varnum, Barre, Vt., operating local granite quarries, have organized the Boutwell, Milne & Varnum Corporation, with operating capital of about \$2,000,000, to take over the property of the company. Plans are said to be under way for extensions.

Sargent & Co., Water Street, New Haven, Conn., manufacturers of builders' hardware, mechanics' tools, etc., have plans for a one-story addition, 60 x 208 ft. Westcott & Mapes, 139 Orange Street, are architects.

Work will soon begin on a one-story plant for the Manufacturers' Equipment & Engineering Co., Framingham, Mass., 60 x 200 ft., with extension, 50 x 70 ft., to be equipped as a japanning works, to cost close to \$60,000 with machinery. Monks & Johnson, 99 Chauncy Street, Boston, are architects and engineers.

The Metalace Corporation, Boston, has leased a portion of the building at 251 A Street, for a wire-weaving and wire-working plant.

The Mason & Parker Mfg. Co., 28 Front Street, Winchendon, Mass., plans the purchase of a 100 kva. electric generator for installation at its hydroelectric power station, including accessory apparatus.

The Newton Centre Garage, Inc., Newton, Mass., will soon begin the erection of a two-story service, repair and garage building at 729 Beacon Street, to cost approximately \$115,000. Ritchie, Parsons & Taylor, 15 Ashburton Place, Boston, are architects.

The Connecticut Light & Power Co., Waterbury, Conn., has acquired the electric property and business of the Westport Water Co., Westport, Conn. A subsidiary, the Westport Electric Co., has been formed to take over the plant and system. Extensions are under consideration, including additional equipment.

The Central Maine Power Co., Augusta, Me., has arranged for a bond issue of \$1,500,000 a portion of the proceeds to be used for extensions in power plants and system.

The Board of Selectmen, Nahant, Mass., plans the installation of high pressure pumping machinery in connection with extensions in the water system, estimated to cost \$200,000.

South Atlantic States

BALTIMORE, July 6.

PLANs are nearing completion for a one-story building, 120 x 245 ft., for the Pioneer Hardwood Flooring Co., Ashland Avenue, Baltimore, to cost approximately \$55,000. F. W. Steiner, 124 North Lakewood Avenue, is architect.

Ovens, power equipment, conveying and other machinery will be installed in the five-story plant, 140 x 220 ft., to be erected by the Ward Baking Co., New York, at Edmondson Avenue and Bentalou Street, Baltimore, estimated to cost \$500,000. C. L. Comstock, 110 West Fortieth Street, New York, is architect.

The Currahee Furniture Co., Toccoa, Ga., has begun the erection of a new plant, 60 x 650 ft., for the manufacture of furniture specialties, and will install machinery to give employment to about 100. George D. Trogdon is manager.

The Columbus Electric & Power Co., Columbus, Ga., has disposed of a bond issue of \$2,000,000, the proceeds to be used for work in connection with a proposed hydroelectric generating plant at Bartlett's Ferry, on which operations have begun. Other financing will be carried out later to provide for the complete station.

J. P. Cogburns, South Greenwood, S. C., is planning the purchase of equipment to manufacture concrete sewer pipe, etc., for installation in a proposed local plant.

Ovens, power equipment, conveying machinery and other mechanical equipment will be installed in the four-story plant to be erected by the General Baking Co., 343 Madison Avenue, New York, at Baltimore, estimated to cost \$450,000, for which plans are being completed by C. L. Comstock, 110 West Fortieth Street, New York, architect.

The Sure-Find Drop Wire Co., Durham, N. C., recently formed with a capital of \$100,000, will operate a plant for the manufacture of wire devices and equipment for cotton mills. Edwin H. Bowling, Walts Street, is president.

The Twin Tree Lumber Co., Hopkins, Ga., has preliminary plans for a new mill with power house in the vicinity of Warsaw, Ga., reported to cost \$75,000 with equipment.

The Hackley-Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for a power-driven hack saw; a motor-driven pipe-cutting and threading machine to handle pipe from 1 to 6 in. in diameter; one steam shovel, about 3½-yd. capacity; one 36-in. gage Shay geared locomotive, 32 to 42 tons capacity, and one electric starter for 25-hp. motor, 220 volts, 60-cycle, three-phase.

The East Carolina Railway Co., Tarboro, N. C., has inquiries out for a combination tractor ditching machine, with dipper and clam shell bucket.

The Alexandria Lighting Co., King Street, Alexandria, Va., is completing plans for an addition to its steam-operated electric power plant, to include the installation of a 5000-kw. generator and accessory equipment. Day & Zimmerman, Inc., 1600 Walnut Street, Philadelphia, is engineer.

The Piedmont Electric Co., Electrical Building, Asheville, N. C., has inquiries out for an overhead electric traveling crane, equipped with trolley carriage to move longitudinally across the bridge, designed to operate a clam shell bucket.

The Seaboard Air Line Railway Co., Norfolk, Va., will proceed with the construction of a new locomotive and car shops at Wildwood, Fla., for which a general contract recently was awarded to Duke & Smith, Portsmouth, Va., estimated to cost \$250,000. Charles R. Capps is vice-president in charge.

The Carolina Electric Repair Co., Charlotte, N. C., has inquiries out for three jacklifts, Lewis-Shepard type, about 5000 lb. capacity.

The Stokes County Board of Education, Danbury, N. C., J. C. Carson, superintendent, is considering the installation of manual training equipment in its new high school to cost \$150,000. Linthicum & Linthicum, 117 West Main Street, Raleigh, N. C., are architects.

The Broad River Power Co., Columbia, S. C., has plans for extensions in its steam-operated electric power plant, to include the installation of a 27,000-hp. generator and accessory equipment, estimated to cost \$450,000 with machinery.

S. P. Tobin, Bamberg, S. C., is in the market for a centrifugal pump with capacity of about 125 gal. per min.

The Interstate Utilities Corporation, Washington, has acquired the municipal electric power plant at Statesboro, Ga., and contemplates extensions.

F. B. Cole, P. O. Box 563, Newnan, Ga., has inquiries

out for a Diesel or semi-Diesel type engine, about 250 hp., with accessory equipment.

The City Council, Norfolk, Va., is said to be planning the installation of additional pumping machinery at the water-works to provide for service in South Norfolk, estimated to cost \$75,000. W. B. Causey is city manager.

Pittsburgh

PITTSBURGH, July 6.

THE local machine tool market is marking time. Those with important requirements to cover apparently are in no hurry to close and single tool orders usually represent as much sales effort as is often expended on list inquiries.

The Armstrong Steel Co., 904 Park Building, Pittsburgh, is in the market for tungsten ores, high speed steel scrap, Swedish iron and muck bar.

A general contract has been awarded by the Conewango Machine Shops, North Market Street, Warren, Pa., for a one-story addition to cost \$25,000, for which a lathe, drill press, grinder, etc., will be required.

Contract has been let by the Pierpont Motor Co., 5200 Penn Avenue, Pittsburgh, to Conley & DeMey, for a five-story service, repair and garage building, 130 x 196 ft., to cost about \$325,000 with equipment. M. F. McWilliams, 127 North Highland Avenue, is architect.

The Board of Public Education, 725 Fulton Building, Pittsburgh, is asking bids until July 16 for steel shelving and lockers for the Allegheny Vocational School. George W. Gerwig is secretary.

The Standard Underground Cable Co., Seventeenth and Pike Streets, Pittsburgh, has filed plans for extensions and improvements to cost approximately \$22,000.

The Central Pipe & Supply Co., Spring and Bullitt Streets, Charleston, W. Va., has inquiries out for a belt-driven hack saw, suitable for cutting shafting up to 3½ in. in diameter.

The Elkland Fire Brick Co., Charleston, W. Va., recently organized with a capital of \$150,000, has acquired about 300 acres and contemplates the erection of a new plant for the manufacture of fire brick and refractories to cost \$75,000. W. W. Price, 311 Bigley Avenue, heads the company.

The Pinkerton Motor Co., 1300 Irwin Avenue, Pittsburgh, has awarded a general contract to the Inland Construction Co., for the erection of its two-story and basement service, repair and garage building, 70 x 86 ft., estimated to cost \$45,000. Arthur Bowman, Bessemer Building, is engineer.

The South Penn Oil Co., Union Trust Building, Charleston, W. Va., is arranging for a new gas compressor plant in the vicinity of Yawkey, W. Va., estimated to cost \$100,000 with equipment. The work will be carried out in connection with the construction of a new line in Lincoln County.

Philadelphia

PHILADELPHIA, July 6.

CONTRACT has been let by the Atlas Electric Co., 1212 Hamilton Street, Philadelphia, manufacturer of electrical equipment, to the Farrell-Roth Co. for a two-story addition to cost \$50,000.

Fire, July 1, destroyed a portion of the shipways and other property at the plant of the William Cramp & Sons' Ship & Engine Building Co., Richmond and Norris Streets, Philadelphia, with loss reported at \$250,000.

The Bridgman Co., Philadelphia, heating and plumbing equipment, has acquired about 3 acres at Reading, Pa., and plans the construction of a new branch storage and distributing plant to cost \$130,000 with equipment. It will also continue its branches at Allentown and Chester, Pa.

The School District of Radnor Township, Wayne, Pa., plans the installation of manual training equipment in its proposed new senior and junior high school estimated to cost \$500,000, for which bids have been asked on a general contract. Irwin T. Catherine, Philadelphia, is architect.

The Willard Storage Battery Co., Philadelphia, with main plant at Cleveland, has leased a building in course of erection at 3613-17 Walnut Street for a new factory branch.

The Crooks-Dittmar Co., Day Street, Williamsport, Pa., manufacturer of flooring and other finished wood products, has awarded a general contract to the H. K. Ferguson Co., Cleveland, for a new one-story plant, 340 x 387 ft., to cost \$200,000 with machinery.

Officials of the New York & Pennsylvania Co., York Haven, Pa., operating paper mills in this section, have formed a company in Delaware of the same name with capital of \$9,000,000 to take over the present plants. Plans are under way for extensions and betterments in the mills. The company is headed by Augustus C. Paine, Jr., Gibson and Eustis Paine, all of Willsboro, N. Y.

The Pennsylvania Power & Light Co., Allentown, Pa., will soon begin superstructure work for its proposed hydroelectric generating plant at Kimbles, near Hawley, Pa., to cost \$5,000,000 with machinery. A steel tower transmission line will be built. Work is also in progress on a power dam at Willsonville to cost approximately \$7,500,000.

The Holland Furnace Co., Holland, Mich., manufacturer of hot air furnaces, etc., has awarded a general contract to F. H. Clement & Co., Bethlehem, Pa., for its proposed branch plant on local site recently acquired. It will consist of two one-story structures, 140 x 508 ft., and 140 x 140 ft., to be equipped as a foundry, grinding and cleaning department, sheet metal plant and assembling works, estimated to cost \$200,000.

The Board of Education, Williamsport, Pa., plans the installation of manual training equipment in its proposed three-story and basement high school estimated to cost \$400,000, for which plans are being drawn by Guilbert & Betelle, Chamber of Commerce Building, Newark, N. J., architects.

The J. E. Williamson Co., Bellwood, Pa., manufacturer of gray iron and semi-steel castings, advises that its works was not destroyed by fire, as was erroneously stated last week. The plant destroyed was the Bellwood Foundry & Machine Co. The Williamson foundry is operating every day and in the past two months added a machine shop to better serve its customers.

The Universal Sand Co., New Castle, Pa., is in the market for a clam shell bucket, about 1½ yd. capacity.

The Woodbridge Fire Brick Co., Woodbridge, N. J., has purchased the plant of Berry Brothers and is now engaged in the manufacture of fire brick. Since the first of the year the plant has been reorganized and much new machinery has been installed.

H. S. Getty & Co., Philadelphia, who, as announced in a recent issue of THE IRON AGE, will expand their manufacturing facilities, will have considerably larger capacity as soon as present construction work is completed. One new unit consists of a two-story factory, 48 x 80 ft., and there will also be a brass foundry, 30 x 75 ft. An electro-plating department will be installed in the new plant. The company manufactures marine hardware, builders' hardware, steel sash and other hardware products.

Milwaukee

MILWAUKEE, July 6.

JUDGING by the increase in inquiry the past week, the passing of the mid-year inventory period will witness a substantial improvement in the demand for equipment. Receivers of the Chicago, Milwaukee & St. Paul Railway are placing scattering orders for additional equipment for the West Milwaukee car and locomotive shops and have considerable to buy still. Shops manufacturing automotive units, parts and materials are making some replacements. Business retains a spotty complexion and no extensive individual orders are in immediate prospect.

The Milwaukee Department of Public Works, R. E. Stoelting, commissioner, is ready to start work on a municipal service building to cost about \$175,000. It will contain a complete machine shop for new and repair work on all municipal equipment, and will be a concentration of these activities now carried on in a number of small shops or by custom shops. Bids for all materials required for the construction of the building will close July 15.

The Wisconsin Great Lakes Coal & Dock Co., 425 East Water Street, Milwaukee, has let the general contract to the Mead, Morrison Mfg. Co. for a new electrically-operated coal handling bridge, with two 10-ton clamshell buckets, at its docks at Twentieth and Canal Streets. The cost is estimated at \$100,000.

The Northern Corrugating Co., Green Bay, Wis., is making repairs and minor replacements of equipment to offset an estimated loss of \$7,500 by fire.

The Wisconsin Waste & Wiper Co., 709 Windlake Avenue, Milwaukee, has started work on the construction of an addition, 40 x 100 ft., two stories and basement. The architect is Stanley F. Kadow, 208 Howell Avenue, local.

The Kimberly Clark Co., Neenah, Wis., has let contracts for the erection of a five-story paper mill addition, 80 x 100 ft., costing about \$200,000, and is buying electric motor equipment and special machinery. Charles L. Henderson is chief engineer.

The Kiel, Wis., Village Board has accepted the bid of W. F. Ribbens, Mayville, Wis., for the complete construction of a municipal sewage disposal plant costing about \$35,000. The project is in charge of the Jerry Donahue Engineering Co., Sheboygan, Wis.

The Beloit Foundry Co., Beloit, Wis., has awarded contracts for the erection of a new plant, 84 x 200 ft., to replace the old plant which was badly damaged by fire recently. The new shop is to be ready Aug. 1.

William Halbersleben, County highway commissioner, Baraboo, Wis., will close bids July 16 for the erection of a machine shop, 45 x 102 ft., part two stories, for servicing County road construction and maintenance machinery, trucks, etc. Complete machine shop equipment will be installed, much of it, however, being used machinery.

The Progressive Tool Co., Beloit, Wis., manufacturer of rotary pumps, special machinery, tools, dies, etc., has purchased the factory property of the Clinton Mfg. Co., Clinton, Wis., and is transferring the operation. The new plant will start operations July 15. W. S. Perrigo is general manager.

The Stoughton, Wis., Foundry Co. is being organized by George Ford, formerly general manager Stoughton Division, Moline Plow Co., to engage in the commercial casting business. Mr. Ford has been granted a five-year lease of the foundry department of the Moline plant by the city of Stoughton, Wis., which recently acquired the entire plant for \$100,000.

The Ajax Foundry Co., South Milwaukee, Wis., has been incorporated with \$10,000 capital stock by John M. Donahue, LeRoy Christensen and Cyrus C. Thieme to engage in the production of non-ferrous castings. A building has been leased and arrangements for furnaces and other equipment are now being made.

The Rice Lake, Wis., Common Council closes bids July 14 for the complete construction of an additional source of water supply, including drilling a 16-in. or 20-in. well, a new pump house, electrically-operated pumping equipment, and a new 150,000-gal. steel tank and tower. The consulting engineer is J. H. A. Brahtz, 601 Builders Exchange, St. Paul, Minn. Oscar G. Jensen is city clerk.

The Koehring Corporation, Milwaukee, manufacturer of concrete mixers, paving outfits, gas engines, etc., has placed contracts for the erection of an extension to its core-room, 30 x 90 ft. The architects are Herbst & Kuenzli, 130 Grand Avenue, local.

Buffalo

BUFFALO, July 6.

THE Harvey-Hanes Machine Corporation, 308 Terrace Street, Buffalo, manufacturer of special machinery and parts, has plans for a two-story machine shop, 50 x 90 ft., to cost \$35,000. E. H. Reidpath, 28 Hartwell Road, is architect.

The Donner Steel Co., 475 Abbott Road, Buffalo, has plans for the electrification of its steel works to replace present steam-driven apparatus. Frank R. Huston is vice-president and general manager.

The Interstate Machinery Products Co., 56 Allen Street, Rochester, N. Y., will soon take bids for a two-story addition, 35 x 82 ft., to cost \$27,500. Wood & Dreschler, National Bank of Rochester Building, are architects. F. Buckley is one of the heads of the company in charge.

The Stephen Stewart Grain Corporation, Hamburg Turnpike, Buffalo, has taken out a permit to build a new grain elevator to cost approximately \$800,000, including elevating, conveying, loading and other equipment.

The Board of Education, Genesee Building, Buffalo, plans the installation of manual training equipment in its proposed three-story high school at Northampton and Fougerson Streets, estimated to cost \$1,500,000, for which bids are being asked on a general contract until July 16. F. J. and W. A. Kidd, 524 Franklin Street, are architects.

The Knab Corporation, United Building, Rochester, has been incorporated for \$100,000 to manufacture Adjusto gutter hangers. For the present the hangers are being made under contract with the National Machine Tool Co. S. C. Wilson is president.

The North East Electric Co., Rochester, N. Y., has been granted a permit for the construction of a new factory to cost \$325,000. It will be of reinforced concrete, 108 x 145 ft., six stories.

The Lexington Machine Corporation, recently organized and incorporated for \$500,000, has acquired the assets of the Rochester Motors Corporation. Both companies are at Rochester, N. Y. The Lexington Machine Corporation has as its president and treasurer Bicket Nairn, formerly identified with the Rochester Motors Corporation. Charles F. Morley, president Morley Machinery Corporation, is vice-president of the company, and John F. Thomas, lawyer, is secretary. The plant of the Lexington Machine Corporation is equipped for doing all kinds of machine work.

F. S. Mallery, 665 Main Street, Olean, N. Y., and associates are in the market for transmission, conveying and hoisting equipment, for installation at a sand and gravel property.

The Board of Public Utilities, City Building, Jamestown, N. Y., Melvin O. Swanson, superintendent, has awarded contract to the Charles Haas Construction Co., Twelfth and Monroe Streets, for an addition to the municipal power plant, for which considerable equipment will be required.

A general contract has been awarded by the Herald Furniture Co., Inc., Falconer, N. Y., for a two-story and basement factory, 70 x 140 ft. Considerable wood-working machinery, as well as transmission, conveying and power equipment, will be required. E. E. Anthony is secretary-treasurer.

Fire, July 1, destroyed the tin and metal shop of the Trico Products Co., 624 Ellicott Street, Buffalo, N. Y., manufacturer of automobile windshield wipers, with a loss of \$25,000. Plans for rebuilding are under consideration.

Manual training and vocational departments will be installed in connection with a new high school at Franklinville, N. Y., for which a general contract has been awarded to Dean, Duffy & Leichte, Olean, at a bid of \$225,000.

Cincinnati

CINCINNATI, July 6.

LOCAL production of machine tools is being sustained at the level reached several weeks ago. Many plants are busier than they have been at any previous time this year. The market is somewhat spotty, however, as certain plants report conditions to be quiet. The majority of the large companies have made good sales and are operating at a fairly satisfactory rate. One manufacturer reports that he has a larger force of employees than at any time since 1920. One of the largest plants has experienced a better business during June than its officials had anticipated. Indications point to a slight falling off in production during July and August as a natural result of the vacation period. Executives believe that machine tool sales in the fall will be good.

Placing of considerable business by the Santa Fe Railroad has been a feature of the local market. This road has placed an order for a 32-in. shaper with the Cincinnati Shaper Co. and an order for a 5-ft. boring mill with the Cincinnati Planer Co. It has also purchased a large radial drill from another local builder. The Chesapeake & Ohio bought a 12-ft. flanging clamp, while the Chicago, Milwaukee & Saint Paul recently bought several engine lathes in this market. The Mobile & Ohio was the buyer recently of a turret lathe for shipment to Murphysboro, Ill., shops. Local manufacturers are expecting the Burlington Railroad to place some of its requirements here shortly.

The automotive field is still yielding important orders. The Ford Motor Co., which placed a sizable order for special machines with the Morris Machine Tool Co. several weeks ago, has ordered additional machines from this company. The Briggs Mfg. Co., Detroit, has divided a list calling for 65 presses, totaling approximately \$35,000, among several builders. It is reported that a Cincinnati manufacturer booked an order for 25 of these presses. Planer manufacturers are quoting on a liberal volume of inquiries. Demand for shapers is fairly good. Two shapers have been sold in the New Orleans territory in the past week. Milling machine manufacturers state that June was a satisfactory month and that orders from automobile manufacturers have been an influential contributing factor to the total volume of business. A local boring mill maker sold six machines in the past several weeks. The S. R. Papch Mfg. Co., Rutland, Vt., has purchased a 6-ton trolley.

Several local manufacturers continue active in the foreign field. The Cincinnati Shaper Co. booked a shaper from the Cuban-American Sugar Co. for Cuban delivery.

Another company sold three rotary millers in Europe. A fair demand for automatic lathes is also reported from several European countries.

The Joseph Schonthal Co., Columbus, Ohio, manufacturer of iron and steel products, has acquired the Frederick Cowin Rolling Mill Co., Joliet, Ill., which will be operated as the rolling mill division of the Joseph Schonthal Co.

The Southern Textile Machinery Co., Paducah, Ky., manufacturer of the Wright patent dial looper, will soon begin erection of a new two-story plant, 90 x 200 ft. all-steel construction.

The factory and general offices of the Federal Mfg. Co., Columbus, Ohio, one of the oldest manufacturers of brass goods in the United States, has been moved to Marysville, Ohio, 30 miles from Columbus, where a larger and modern plant has been acquired. Additional machinery and other equipment will be installed to increase capacity. The name has been changed to the Federal Brass & Mfg. Co. but there has been no change of personnel or of the organization. The Federal Brass & Mfg. Co. specializes on hose cocks, gas cocks, stove and range cocks, manifolds, air shutters and flexible lead and annealed brass and copper heater and range connectors, and a fine line of gas and electric fixtures. Scott Van Etten is secretary and general manager.

Several warehouses, a power plant and a box factory of the Charles Boldt Glass Co., Cincinnati, were destroyed at Huntington, W. Va., on July 1, with a loss of \$300,000. Fred W. Schwenck, president, states that the company has not yet decided whether to rebuild.

Harry Hake, Telephone Building, Cincinnati, architect, has awarded a general contract to the Ferro Concrete Construction Co., for a three and four-story automobile service, repair and garage building, 115 x 130 ft., at Alms Place, estimated to cost \$170,000. The same architect has also taken out a permit to erect a similar building, two-stories, at 2100 Gilbert Street, to cost close to \$80,000.

Mills Brothers & Darter, Inc., Greeneville, Tenn., has plans for the erection of a one-story woodworking factory, 50 x 100 ft., to cost about \$30,000 with machinery.

The Miami Garage Co., Dayton, Ohio, recently formed by Howard Maston, Dayton, and associates, has plans for a four-story service, repair and garage building, 120 x 200 ft., to cost \$200,000.

The Blue Ring Products Co., 1014 James Building, Chattanooga, Tenn., has inquiries out for grinding and mixing machinery for installation in a local plant.

The Louisville Gas & Electric Co., Louisville, has arranged for an increase in capital from 2300 to 1,300,000 shares of stock, without par value, a portion of the proceeds to be used for extensions in plant and system.

The Kroger Grocery & Baking Co., Cincinnati, is planning the erection of a warehouse and storage plant, equipped with refrigerating machinery, a bakery and a garage in Columbus, Ohio. W. H. Albers is general manager.

Fire, June 13, destroyed a portion of the plant of the Paducah Lumber & Mfg. Co., Paducah, Ky., with loss estimated at \$150,000 including equipment. Rebuilding plans are under advisement.

St. Louis

ST. LOUIS, July 6.

THE superstructure is under way for the new four-story and basement plant, 130 x 250 ft., for the Columbian Steel Tank Co., 1600 West Twelfth Street, Kansas City, Mo. A. M. Griffin is consulting engineer; A. A. Kramer is president.

The Southwest Power Co., McAlester, Okla., has plans for extensions in its steam-operated electric power plant to cost \$17,000.

Officials of the Joseph Greenspon's Sons Iron & Steel Co., 3130 Hall Street, St. Louis, have acquired the plant and business of the Universal Glass Co., Valley Park. The new owner is considering extensions and improvements. It is expected to organize a subsidiary to be known as the Joseph Greenspon Sons' Glass Co., capitalized at \$500,000.

The Common Council, Okmulgee, Okla., plans the installation of pumping equipment in connection with proposed extensions and betterments in the municipal waterworks to cost \$750,000. The Holway Engineering Co., Wright Building, Tulsa, Okla., is architect.

The Board of Education, Mayo Building, Tulsa, Okla., plans the installation of manual training equipment in its proposed Hollywood and Northeast junior high schools, estimated to cost \$350,000 and \$150,000, respectively, for which it is expected to ask bids on a general contract in August. Leland I. Shumway, Wright Building, is architect. Cook & White, Kansas City, Mo., are engineers.

The Backbone Mining Co., Excelsior, Ark., has plans for rebuilding the portion of the tippie at its mining properties near Excelsior, estimated to cost \$30,000. J. G. Puterbaugh, McAlester, Okla., is in charge.

The Wichita Railway & Light Co., 107 South Main Street, Wichita, Kan., has plans for a one-story and basement automobile service, repair and garage building, 100 x 110 ft., for company trucks and cars, estimated to cost \$30,000. Howard W. Patten is manager.

The Acme Mining Co., 320 Walls Street, Joplin, Mo., L. P. Buchanan, in charge, will proceed with the erection of a new mill in the Waco field to cost \$125,000. The majority of the machinery will be electrically-operated.

The Cuthbert Cut Stone Co., North Elizabeth Street, Wichita, Kan., has plans for a new two-story and basement works, 100 x 125 ft., to cost \$70,000.

The Hudson-Essex Motor Co., 429 St. Louis Street, Springfield, Mo., has plans for a one-story service, repair and garage building, 170 x 265 ft., to cost \$60,000.

Chicago

CHICAGO, July 6.

THE first week in July brought out two large new lists, one from the Chicago, Milwaukee & St. Paul, embracing 56 items, and another from the Chicago Board of Education, including 29 items, for the Carl Schurz High School, one for the Austin High School and four for the South Division Continuation School. The Chicago, Milwaukee & St. Paul has closed for considerable equipment against a list issued in May, representing requirements for a new shop at St. Paul, Minn. Among machines ordered are a journal lathe, a 36-in. geared head motor-driven engine lathe, an 18-in. geared head motor-driven engine lathe, a 100-in. 600-ton hydraulic wheel press, a hack saw, two motor-driven grinders and a number of second-hand tools, including a boring mill and radial drills.

The Northern Pacific has placed orders for two 30-in. journal turning, pin truing and quartering machines. The Santa Fe has not yet completed its purchases, and may not take final action on a considerable portion of its list for some time. The Burlington's outlay for machine tools will probably not exceed \$100,000, with the likelihood that some used equipment will be bought. Industrial orders are scattered but in the aggregate, form an encouraging total. The Beardsley & Piper Co., Chicago, has closed for a No. 4 plain milling machine. A number of Western machine tool manufacturers, notably in Milwaukee, are operating at a very satisfactory rate.

*Chicago, Milwaukee & St. Paul List
(Machine Tools to Be Motor-Driven Except When
Otherwise Indicated)*

One 90-in. journal turning machine.
One 5-ft. 10-in. x 16-ft. car type annealing furnace.
One 36-in. heavy-duty draw cut shaper.
Two 42-in. vertical turret lathes.
One 3-ft. plain radial drill.
One 1½-in. double-head bolt cutter.
One 5-ft. plain radial drill.
Two 3-ft. plain radial drills.
Five 3-ft. plain radial drills, belt driven.
One steel power brake to bend No. 10 gage iron up to 10 ft. 1 in. long.
One 200-lb. Chambersburg self-contained steam hammer.
One second-hand single frame 800-lb. steam hammer.
One 1500-lb. single frame steam hammer.
One locomotive driving wheel lathe.
Two ¾-in. McCabe flangers.
One 32-in. crank planer.
Two 14-ft. vertical bending rolls, capacity 1¼-in.
One 24-in. x 12-ft. heavy-duty geared head engine lathe.
One 27-in. x 14-ft. heavy-duty geared head engine lathe.
One geared power squaring shear with 18-in. gap capacity to shear No. 10 gage iron up to 8 ft. long.
Two floor grinders with 18 x 3-in. wheels.
Two 36-in. heavy-duty draw cut shapers.
One 16-in. x 8-ft. tool-room lathe.
One 3300-lb. single frame guided ram steam hammer.

One high-power rapid production turret lathe with 7½-in. hole through spindle.
One 2-in. single head bolt cutter, belt driven.
One 600-ton inclined head hydraulic locomotive wheel press.
Two 4-ft. plain radial drills.
One turret lathe, 3¼ x 29 in., with 16½-in. swing, belt drive.
One 5 x 9 x 13½-in. oven furnace, gas fired.
Two 8 x 20 x 30-in. oven furnaces, gas fired.
One 14 x 30 x 12-in. oil tempering furnace, gas fired.
One No. 5 plain inclinable punch press, belt drive, capacity 50 tons.
One sensitive high speed tool-room drill, capacity ¾ in., belt drive.
One 12 x 36-in. universal grinding machine.
One universal cutter and reamer grinder, equipped with extension centers, belt drive.
One universal tool grinding and shaping machine, equipped with 3 x 3-in. chuck, belt drive.
One automatic gear cutting machine to cut spur gears 36 in. in diameter and 3 diametrical pitch bevel gears 21 in. in diameter and metre gears 24 in. in diameter, belt drive.
One double-head electric floor grinder, 12 x 2-in. wheels.
One 21-in. upright drill, belt drive.
One 10-in. vertical shaper, belt drive.
One 16 x 36-in. tool-room lathe, belt drive.
One 28-in. belt-driven shaper.
One 3000-lb. crane truck with 15-ft. boom and auxiliary boom, including battery and battery charger.

*Chicago Board of Education List
For Schurz High School*

(All Machine Tools to Be Motor-Driven)

Three 20-in. upright drills.
Two ball-bearing floor-type grinders, each with two 14 x 2 x 1¼-in. emery wheels.
One 16-in. x 6-ft. South Bend engine lathe, or equivalent.
One 9-in. x 3-ft. South Bend engine lathe, or equivalent.
One Canedy-Otto, or equal, No. 35 upright drill.
One electric bench grinder fitted with two wheels, one fine, one coarse.
One Black & Decker air compressor outfit.
One motor generator set, 220-volt, three-phase, 60-cycle motor.
One Weidenhoff super-service bench, Model 24 with self-aligning flexible drive.
One Weidenhoff No. 5B high discharge battery tester.
Two 14-in. high-duty crank shapers.
One No. 1 universal milling machines.
Four 11-in. x 3-ft. screw cutting engine lathes.
No. 1 Stewart oven furnace, opening 5 x 9-in., depth 13½ in.
One 20-in. wet tool grinder with 20 x 2½-in. grinding wheel.
One two-wheel floor grinder with 10 x 1 x ¾-in. wheels.
Two high-speed sensitive bench drills with vertical travel of spindle 4 in. and vertical travel of table 10 in.
Two 50-lb. wrought iron blacksmith's anvils with hardened steel faces.
One 200-lb. wrought iron blacksmith's anvil with hardened steel face.

For Austin High School

One 16-in. shaper.

For South Division Continuation School

Four geared head 12-in. x 6-ft. engine lathes.

The National Cast Iron Pipe Co., Birmingham, has purchased 50,809 sq. ft. at Forty-eighth and Whipple Streets, Chicago, along the Chicago Junction Railway from the Kenwood Manufacturing District and will erect a warehouse and shops representing a total investment of \$100,000.

Hansen, Sommer & Maca, Inc., 671-3 West Sixteenth Street, Chicago, has awarded contract for a one-story factory, 94 x 101 ft., for the manufacture of glass machinery, to cost \$25,000.

The H. W. Caldwell & Son Co., machinery manufacturer, Western Avenue and Seventeenth Street, Chicago, has awarded contract for a one-story power house at 2430 West Eighteenth Street, to cost \$10,000.

The American Colortype Co., 1151 Rockwell Street, Chicago, has awarded contract for a one-story printing plant, 79 x 123 ft., at 3301-11 North Racine Avenue, Chicago, to cost \$50,000.

The Chicago Valve Co., 319 West Ohio Street, Chicago, recently incorporated with \$100,000 capital stock, will manufacture flush valves in a plant leased at the address given. Officers are E. L. Kellan, president and treasurer, and E. V. Kellan, vice-president and secretary.

The Blackhawk Mfg. Co., 1826 North Tripp Avenue, Chicago, recently incorporated with \$5,000 capital stock, will manufacture tools, dies, metal specialties, special

machinery, etc. A plant, 25 x 50 ft., has been leased at the address given and equipment to be bought includes engine lathes, a milling machine, shaper, turret lathe, bench lathe, filing machine, an automatic gear cutter, tempering ovens, a compressor, punch press, tumbler, drill presses, etc. Officers are John Kluson, president; Elizabeth Glatt, vice-president; and Wm. E. Glatt, secretary and treasurer.

Bids will be asked before the end of the month by the General Radiator Co., Continental Bank Building, Chicago, for superstructure work for its two-story and basement plant at Quincy, Ill., 348 x 468 ft., estimated to cost \$500,000 with equipment. George B. Behrensmeier, 430½ Main Street, Quincy, is architect.

The Western United Corporation, Aurora, Ill., operating the Aurora, Elgin & Fox River Electric Co., Western United Gas & Electric Co., and other utilities, is disposing of a note issue of \$1,500,000, a portion of the proceeds to be used for extensions and improvements.

Headquarters of the Great Western Sugar Co., now considering a project for a new beet sugar mill in the vicinity of Julesburg, Colo., referred to last week, are in the Sugar Building, Denver, Colo., and not at Ladysmith, Wis., as previously reported.

The Water, Light, Heat, Power & Building Commission, Buhl, Minn., is taking bids until July 14 for extensions and improvements in the municipal electric power plant, including coal and ash-handling equipment, etc. Charles Foster, Sellwood Building, Duluth, Minn., is engineer.

The Chicago, Rock Island & Pacific Railroad Co., La Salle Street Station, Chicago, will erect a one-story repair shop, 100 x 200 ft., at 4951 Wentworth Avenue, to cost \$52,000, for which a general contract has been awarded to the T. S. Leake Construction Co., 608 South Dearborn Street.

Bids will be received until July 21 by the Board of Trustees, Lansing, Ill., for a motor-driven centrifugal pump for deep well service, with capacity of about 700 gal. per min., also for one steel tower in connection with improvements in the municipal waterworks. Ashdown, Williams & Co., Chicago Heights, Ill., are engineers.

The American Beet Sugar Co., East Grand Forks, Minn., has awarded a general contract to James A. Dinnie & Co., Grand Forks, Minn., for a one-story machine shop at its new mill now under construction. It has closed its mill at Chino, Cal., and will remove considerable equipment from that plant to the local mill. Headquarters are at 32 Nassau Street, New York.

The Western Iowa Power & Light Co., Linn Grove, Iowa, will rebuild the portion of its power plant recently destroyed by fire. An official estimate of loss has not been announced.

Cleveland

CLEVELAND, July 6.

MACHINE tool manufacturers and dealers are doing a good volume of business in single tools which are well scattered among many industries. The Warner & Swasey Co. booked an order during the week for nine large turret lathes for Czechoslovakia for a plant manufacturing diversified lines from sewing machines to locomotives. Buying by the automotive industry is not as active as a few weeks ago although the Chrysler Motors Corporation bought several machines during the week and the Packard Motor Car Co. is still purchasing equipment. There is little demand for brass working machines as the plumbers' brass goods industry seems to have quieted down. Used machinery is selling well. A revival in the call for wood-working machines is noted. Makers of molding machines and other foundry equipment report business rather quiet.

The Firestone Tire & Rubber Co., Akron, Ohio, will erect a three-story brick and reinforced concrete plant extension, approximately 200 x 400 ft. The Osborn Engineering Co., 7016 Euclid Avenue, Cleveland, is architect.

The Toy Kraft Co., Wooster, Ohio, plans the erection of a two-story addition, 60 x 120 ft.

Two manufacturing plants, complete with equipment, one at Salem, Ohio, and the other at Euclid, Ohio, are being offered for sale by the McCabe & Shearan Machinery Corporation, 50 Church Street, New York. The Salem plant consists of a machine shop, foundry, pattern shop, forge shop, etc. The machine shop is 127 x 350 ft., equipped with 25 and 50-ton cranes and having a modern tool room equipment. The Euclid plant has a machine shop of the same

size, but the work of building this plant was not completed, just one structure having been erected. The two plants were built during the war and are now being liquidated by the owner, whose present business does not require them.

Fire, July 3, destroyed the plant and equipment of Yingling Brothers, Monroeville, Ohio, manufacturers of wood and iron handles, with a loss of \$50,000.

Indiana

INDIANAPOLIS, July 6.

THE Banner Rock Products Co., Alexandria, Ind., manufacturer of mineral wool and kindred specialties, has plans for a new one-story works, 150 x 200 ft., to replace a portion of its plant recently destroyed by fire, estimated to cost \$50,000 with equipment.

The Joint School Board of Union and Preble Counties, College Corner, near Liberty, Ind., is considering the installation of manual training equipment in its proposed joint high and elementary school at West College Corner, estimated to cost \$120,000. Omar P. Gordon, Thayer Building, Greenfield, Ind., is architect.

The Board of Trustees, Indiana Reformatory, Pendleton, Ind., is planning to rebuild the machine shops and other mechanical structures at the institution destroyed by fire June 27, with loss estimated at \$17,000. A. F. Miles is superintendent.

The Board of Directors, Hartford Township, Adams County, Ind., Daniel A. Studler, Geneva, Ind., in charge, plans the purchase of an electric-operated pumping engine, pressure tank and accessory equipment for installation in a local school. Snider & Rotz, Merchants' Bank Building, Indianapolis, are architects.

The Central Indiana Power Co., Indianapolis, operating electric light and power properties, is disposing of a note issue of \$5,000,000, a portion of the proceeds to be used for extensions and improvements.

The Mutual Truck Corporation, Sullivan, Ind., is reported to have acquired more than 500 acres at Tampa, Fla., and will use a portion of the site for the erection of a new plant, to cost \$350,000 with equipment. J. M. Sinclair is president.

The Utilitor Co., Indianapolis, capitalized at \$50,000, has been organized to manufacture 4-hp. garden tractors. At present the company is doing only assembly work, but expects to purchase machinery later and is looking for a suitable plant with a view to leasing.

The Brophy Mfg. Co., Indianapolis, manufacturer of fan belts for automobiles, has opened a branch factory at North Vernon, Ind., under the name of the Junior Belt Co.

Detroit

DETROIT, July 6.

BIDS have been asked by the Cadillac Motor Car Co., Detroit, for a two-story and basement service, repair and garage building, 60 x 200 ft., to cost approximately \$60,000. Bonnah & Chaffee, Farwell Building, are architects.

The Ford Motor Co., Detroit, has awarded a general contract to H. C. Struchen, St. Paul, Minn., for additions to its Mississippi River plant, to be equipped for glass manufacturing and other service, to cost approximately \$3,500,000 with machinery.

The American Motor Body Co., 12262 Kercheval Avenue, Detroit, is reported to be considering the erection of an addition to cost \$50,000 with equipment. R. H. Hillman is one of the heads of the company.

The Consumers Power Co., Jackson, Mich., has plans for hydroelectric power house expansion at Coline, Mich., where a power dam is now in course of construction. A transmission line will be built. The entire project will cost \$400,000.

The Michigan Public Service Co., Cheboygan, Mich., is disposing of a note issue of \$500,000, a portion of the proceeds to be used for extensions and improvements.

The Michigan Brush Mfg. Co., 3701 Michigan Avenue, Detroit, manufacturer of vacuum cleaner brushes and devices, has plans for a one-story addition to cost \$55,000. Samuel Scott is president.

The Hannum Mfg. Co., recently formed by George H. Hannum, Detroit, formerly vice-president General Motors Corporation, and T. Ray Johnson, heretofore connected with the Jacox Steering Gear plant of the Saginaw Products Co., Saginaw, Mich., has taken over the plant of the Lavine Gear Co., 66 Keefe Avenue, Milwaukee, and will continue the operation of the works for the manufacture of steering



PAINTING is now being put forward as the solution of the lighting problem of companies having buildings that cannot be altered in lighting arrangements without more expense than is deemed wise. The views are of the interior of a 120 x 350 ft. building in Pittsburgh, used for general storage, now the property of the Duquesne Light Co. The darker view represents the interior just after its transfer to the Duquesne Light Co. with the roof sashes cleaned and one coat of white paint applied by brush to the roof trusses. The lighter view is the same interior after sprayed coats of flat and semi-gloss white paint. Only on very dark days is other than natural light necessary in all three bays of the building. M. R. Sumner, engineer of the Duquesne Light Co., supervised the transformation and the work was done by the Kiefer Sheet & Painting Co., Pittsburgh.

gears and kindred automotive equipment. Expansion is planned.

The Fordson Power Co., Detroit, recently organized by Henry Ford and his son, has preliminary plans for a hydro-electric power project on the Huron River, near Ypsilanti, Mich., reported to cost close to \$500,000.

The Burnside Die & Tool Co., Detroit, is said to be planning the installation of additional equipment.

The Triple Auto Light Co., Stambaugh, Mich., recently organized, has arranged for the operation of a new plant for the manufacture of automobile lighting equipment and devices.

The Board of Education, Pontiac, Mich., is arranging for the early installation of manual training equipment in its new junior high school, on which work is in progress, to cost \$500,000.

The Wolverine Brass Co., Fairbanks St. and Monroe Ave., Grand Rapids, Mich., has awarded a general contract to I. K. Parsons & Son, local, for one story power plant addition to cost \$25,000.

Pacific Coast

SAN FRANCISCO, July 1.

CONTRACT has been let by Gilfillan Brothers, Inc., 1815 West Sixteenth Street, Los Angeles, manufacturer of iron and steel specialties, to Stanton, Reed & Hibbard, Metropolitan Building, for a one and two-story addition, 21 x 175 ft., to cost \$40,000. Lester H. Hibbard, Metropolitan Building, is architect.

The Willys-Overland Co., Toledo, Ohio, has selected a site at Oakland, Cal., for its proposed branch plant, to be used primarily for assembling, to cost \$200,000. The Austin Co., has preliminary plans.

The Pacific Gas & Electric Co., 245 Market Street, San Francisco, has plans for a four-story extension to its automatic power substation at Leidesdorff and Sacramento Streets, to cost \$90,000 with equipment.

The Everett Pulp & Paper Co., Everett, Wash., has plans for a new pulp mill to cost \$400,000 with machinery. George F. Hardy, New York, is engineer. A. H. B. Jordan is vice-president.

The Sunbeam Mining & Reduction Co., Sumner, Wash., is arranging for the erection of the first unit of a new plant for the production of pigments, to be three-stories, 42 x 60 ft., to cost close to \$75,000 with equipment. A contract for building superstructure has been let to the General Iron Works, 3223 First Street, Seattle.

The Golden Age Mining Co., Pioneerville, Idaho, plans the rebuilding of the portion of its power house, compressor building, and hoist plant, recently destroyed by fire. An official estimate of loss has not been announced.

The Merced Irrigation District, Barcroft Building, Merced, Cal., is asking bids until July 28 for equipment for the spillway gates at the Exchequer dam and power plant, including 14 sets of gate operating gearing, cast steel gears and racks, worm and bevel gear drives, etc. H. P. Sargent is secretary.

The Coma-Pima Mining Co., Tucson, Ariz., plans the early construction of a new flotation mill at its Little Mary mining properties in the Babocomi district, near Tucson. It is reported to cost approximately \$200,000 with machinery.

The United Oil Co., Los Angeles, will build an addition to its refinery at Hynes, Cal., bringing up the output from 10,000 to 25,000 bbl. daily. It has also acquired 40 acres on the water front at Los Angeles harbor and will build a new marine terminal for storage and distributing service. The two projects are estimated to cost \$700,000 with equipment.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, is said to have tentative plans under advisement for a new maintenance shop and yards at Riverside, Cal., to cost in excess of \$60,000 with equipment.

Plans are being made by the Lewiston Portland Cement Co., Lewiston, Idaho, for the construction of a cement plant to cost about \$1,500,000. T. J. Klossok, company engineer, is in charge of operations. A 21 mile railroad will also be built.

Gulf States

BIRMINGHAM, July 6.

TENTATIVE plans are being considered by the Texas Power & Light Co., Dallas, Tex., for a new steam-operated electric power plant at Bastrop, Tex., to cost \$109,000 with equipment. A new transmission line will also be built.

The Texas Rail & Supply Co., 1917 Forest Avenue, Dallas, Tex., recently organized, has plans for the erection of a new building for storage, distributing and mechanical service. A circular saw, punch, rail straightener, conveying machinery and other equipment will be installed. L. Feenberg heads the company.

Harry Spricer, Waco, Tex., architect, has completed plans for a two-story automobile service, repair and garage building, 100 x 165 ft., estimated to cost \$47,000 with equipment.

The Southwestern Public Service Co., Amarillo, Tex., is disposing of a bond issue of \$3,500,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Board of Commissioners, Fort Pierce, Fla., is asking bids until July 22 for one steam turbo-generator, with condenser, condensing pumps and auxiliary equipment. The

American Industrial Engineering Co., 140 Cedar Street, New York, is engineer. W. Austin Smith is city manager.

The Woodward Iron Co., Woodward, Ala., plans the construction of a machine shop, forge and blacksmith shop and other buildings at its new coal mines at Mulga, Ala. A power plant will also be built. Frank H. Crockard is president.

The Commissioner of Public Works, Bradenton, Fla., is asking bids until July 27 for one 250,000-gal. elevated steel tank, gate valves, etc. E. V. Camp and associates, Jacksonville, Fla., and Atlanta, Ga., are engineers.

The Grunder Industries, Inc., Beeville, Tex., will soon ask bids for a one-story cotton compressing plant, 160 x 395 ft., to cost \$65,000 with equipment.

The Mississippi Power Co., Gulfport, Miss., has plans for extensions in its steam-operated power house at Hattiesburg, Miss., to include the installation of a new 1500-hp. generating unit and accessory equipment.

The City Council, Bushnell, Fla., plans the installation of pumping equipment in connection with a proposed waterworks, estimated to cost \$55,000, in which amount bonds have been voted. A 75,000 gal. capacity steel water tank with tower will also be installed. W. M. Galt is city engineer.

S. W. Eason, town clerk, Hernando, Miss., is asking bids until July 20 for equipment for a municipal waterworks, including one 10-hp. engine, Fairbanks-Morse type Z, or equivalent; one pumping engine, Luftwiler type or equivalent, capacity 5800 gal. per hr.; one 7½-hp. motor and accessory apparatus.

J. L. Williams, 2028 Fourth Avenue, North, Birmingham, is planning to purchase a quantity of enameling equipment.

The Common Council, Wauchula, Fla., plans the installation of pumping equipment in connection with proposed extensions in the municipal waterworks and sewage systems, estimated to cost \$150,000. It is expected to ask bids early in the fall.

The Olympia Oil & Refinery Co., Brownwood, Tex., is said to have plans under way for extensions in the local gasoline refinery of the Dixie Gasoline Co., recently acquired, with the installation of additional equipment.

Bond Brothers, Inc., Louisville, Oscar S. Bond, president, has tentative plans for the erection of a new creosoting plant and lumber treatment mill on 80 acres at North Montgomery, Ala., lately acquired, with installation to include a power house and machine shop. The estimated cost is placed at \$350,000 with equipment.

The S. & T. Mfg. Co., Inc., New Orleans, recently organized to manufacture automatic fire hose holders, will place its business with stamping works for the time being instead of undertaking production or erecting a plant.

Canada

TORONTO, July 6.

MACHINE tool business continues to hold well up to previous levels and sales figures for the month of June were better than those for the preceding month. In addition to the steady call for single units, buyers are asking for quotations on several small lists. Demand is active for wood-working and paper mill equipment and for electric power plants, with several large orders in prospect which will be closed within the next two or three weeks.

The House of Commons, Ottawa, Canada, recently passed a vote of \$1,600,000 for the construction of a drydock at Esquimalt, B. C.; also the sum of \$130,000 for Port Arthur, and Fort William harbor improvement.

The Abitibi Power & Paper Co., has placed an order with the Canadian General Electric Co., Toronto, for six 6000 kva., 12,000 to 110,000 volt, water cooled, single phase transformers. It is understood that three will be installed at the generating plant at Island Falls and three at Iroquois Falls, Ont.

The New Brunswick Electric Power Commission's application to construct a power development plant at Grand Falls, N. B., has been approved by the International Joint Waterways Commission and the commission will call for tenders in connection with the preliminary construction work. Tenders to close July 29 will also be called for construction of the main dam across the Saint John River, for the intake, forebay, tunnel and power house. The plant will be located within a few miles of the international boundary line.

The Sterling Caskets, Ltd., McDonnell Square, Toronto, will call for bids about July 15 for an addition to its

factory. Machinery will also be purchased. Hall & Duerr, Lumsden Building, Toronto, are architects.

The Eugene F. Phillips Electrical Works, Brockville, Ont., has awarded additional contracts in connection with extensions to its plant. Equipment has not yet been purchased.

Anglin Norcross, Ltd., 65 Victoria Street, Montreal, has the general contract for a factory at Thurston, Que., for the Singer Mfg. Co.

The Corporation of Westmount, Que., will build an addition to the power house and install considerable new equipment.

Western Canada

F. J. Horsey, town clerk, Shaunavon, Sask., will soon call for bids for the construction of a sewage disposal works, including pumping machinery, etc. John Campbell, Masonic Temple Building, Regina, Sask., is engineer.

The British Columbia Gypsum Co., Ltd., will establish works at Port Mann, B. C., where the company has secured a large tract of land near the Canadian National Railway terminus.

The Canada Clay Products Co., Regina, Sask., has been organized to take over the plant of the Estevan Brick Co., local. The new company proposes to install considerable additional equipment and develop a new line of brick and building tile.

Foreign

THE American Chamber of Commerce in France, 32 Rue Taillout, Paris, France, has received an inquiry (I. 3978) from a local company desiring to get in touch with American manufacturers of cottonseed hulling machinery and accessory equipment.

The Public Works Department, Vienna, Austria, has plans for the electrification of about 300 kilometers of its railroad system and will carry out the project within the next 36 months. About 70 electric locomotives will be purchased as well as substation equipment, line material, etc. United States Commercial Attaché H. Lawrence Groves, Vienna, has information regarding the project.

Fire, June 28, destroyed the coconut oil plant at Manila, P. I., of Lever Brothers, London, England, with loss estimated in excess of \$750,000, with machinery. It is planned to rebuild.

Kato Seiju & Co., Ltd., 31 Kitanaka-din, 2-chome, Yokohama, Japan, importer of mechanical apparatus, is interested in the purchase of tools, nails, iron bars and tin plate, and solicits prices and particulars.

The Foreign Trade Bureau, Philadelphia Commercial Museum, Philadelphia, has received the following inquiries: (43742) from Eduardo Suarez Escribano, Lamparilla 63½, Havana, Cuba, desiring to get in touch with American manufacturers of steel sheets, bars and ingots, iron and steel pipe, shovels and hose and refrigerators; (43727) from D. Parkash & Co., Moga, Punjab, India, wishing to get in contact with American manufacturers of tool boxes, incandescent lamps, flashlights, batteries, etc., and (43728) from Benjamin Whittaker, Inc., 21 State Street, New York, wishing to get in touch with manufacturers of small ice-making machines for an inquiry from its representative in Belgium.

La-Ma Importers, Mirzapur Lodhvada, Ahmedabad, India, desire to represent American manufacturers of steam engines, boilers, pumps, engine lathes, drilling machines, hardware, electrical goods, automobile accessories, and carpenters' and blacksmiths' tools.

Keener Sand & Clay Co. Building Sand Mill

The Keener Sand & Clay Co., 514 Hartman Building, Columbus, Ohio, is constructing a new sand mill at Kerr, Ohio, costing approximately \$75,000 with equipment. The mill will be used in the production of No. 3 Gallia red molding sand, giving the company a capacity of 600 tons per day. Gallia red sand is produced for medium and heavy gray iron castings. The new plant is located on the Hocking Valley Railroad near Gallipolis, Ohio.

This new construction gives the company double capacity. It has a plant in the same locality producing No. 4, No. 5 and No. 6 Gallia red sand, where the company has operated during the past 20 years. Harry A. Keener is president and general manager.

John L. Richey, Cincinnati, has been appointed receiver of the McIlvain & Spiegel Boiler & Tank Co., Cincinnati boiler manufacturing concern. John B. Scheibly, president, states that the company's assets exceed its liabilities, but that creditors are pressing for payment of obligations which the company at present is unable to meet.

Trade Changes

The Independent Foundry Supply Co., First and Spruce Streets, St. Louis, M. A. Bell, president, has been appointed by the Hillside Fluor Spar Mines, 38 South Dearborn Street, Chicago, distributor of fluorspar to the foundry trade in Missouri, Kansas, Iowa, Nebraska, Oklahoma, Texas and southern Illinois.

John A. Granger & Sons Co., recently incorporated, 319 West Ohio Street, Chicago, is direct mill distributor for the Broderick & Bascom Rope Co., St. Louis, manufacturer of wire rope; the Ajax Rope Co., Brooklyn, N. Y., manufacturer of manila rope; the American Bolt Corporation, Detroit, Mich., manufacturer of turnbuckles, bolts and rivets; the Western Block Co., Lockport, N. Y., manufacturer of tackle block, and other manufacturers of railroad, mill, mine and contractors' supplies. Officers are John A. Granger, president and treasurer; William J. Tension, vice-president, and Robert A. Granger, secretary.

The Scott Valve Mfg. Co., Detroit, announces the appointment of H. P. Rodgers & Co., Leader-News Building, Cleveland, as representative there for the entire line of Scott bronze and iron body valves.

The Foote Brothers Gear & Machine Co., Chicago, has made arrangements with the McBurney Stoker & Equipment Co., 619 Trust Co. of Georgia Building, Atlanta, Ga., to act as distributor of its gear products in Georgia.

The Alvord Reamer & Tool Co. and the A. J. Polk & Son Co., both of Millersburg, Pa., have consolidated and hereafter will be known as the Alvord-Polk Tool Co.

The Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Cleveland, has appointed the following companies as tramrail dealers in their respective territories: Kirkby Machinery Co., 109-11 St. Clair Avenue, Toledo, Ohio; J. H. Overpeck Co., House Building, Pittsburgh; A. D. Heath Machinery Co., Merchants Bank Building, Indianapolis; Julius Andrae & Sons, Broadway and Michigan Streets, Milwaukee; George E. Coursey, 701 Union Central Building, Cincinnati, and D. H. Braymer Equipment Co., 727 W. D. W. Building, Omaha, Neb.

The Crippen Mfg. Co. has moved its factory and offices from Mount Pleasant, Mich., to Alma, Mich.

The Conveyors Corporation of America, Chicago, has appointed the Chicago Electric Co., 740 West Van Buren Street, Chicago, district representative for the sale of American monorail cable conveyors in northern Illinois and northern Indiana.

The E. L. Essley Machinery Co., Chicago, has made an exclusive agency contract with the Buffalo Forge Co., Buffalo, to sell its Armor Plate punches and shears, bar cutters, slitting shears, beam shears, etc., in Chicago territory.

The Johnston Mfg. Co., Minneapolis, manufacturer of industrial oil burning equipment, has appointed Otis B. Duncan, 53 West Jackson Boulevard, Chicago, as representative for the Chicago territory.

Braun & Bredy, 549 West Washington Street, Chicago, have been appointed sales agents for Chicago territory by the Waddell Steel Co., Niles, Ohio, manufacturer of sheet steel and the Worcester Pressed Steel Co., Worcester, Mass., manufacturer of cold rolled strip steel.

Watson, Kristeller & Swift, 68 William Street, New York, have succeeded A. J. Rosell, 205 South Oxford Street, Brooklyn, as manufacturers of the line of elevators which the latter concern made for many years.

Pearson Brothers, Inc., 57 Murray Street, New York, took over the assets and liabilities of Mooney, Douglas & Pearson, Inc., contractor's equipment and supplies, on June 30. S. J. Pearson and W. W. Pearson have carried on the business since H. F. Mooney and R. K. Douglas severed their connection with the company two years ago.

The Young Brothers Co., Detroit, has moved its Cleveland office from 730 Engineers Building to 1424 Guarantee Title Building. C. G. Lisch is manager.

The Ex-Cell-O Tool & Mfg. Co., Detroit, announces the appointment of the National Supply Co., Toledo, Ohio, as its exclusive representative for the sale of drill jig bushings for northwestern Ohio. H. E. Oatis is Toledo branch manager.

Compiles Grinding Machine Performances

In an illustrated booklet descriptive of its high-power surface grinder, the Blanchard Machine Co., Bridgeport, Conn., gives interesting examples of the productivity of the machine on various types of work. As the reduction of time on machining operations is becoming more and more a primary consideration in the purchase of machine tools, the Blanchard presentation of such data is timely.

A typical illustration shows the grinding of milling cutter blanks, 4 x 7-16 x 1½ in. These were ground on a No. 16 machine with a 30-in. chuck. Both sides were ground, the material being high speed steel, and the stock removed on each side was 0.015 in. and the limits 0.0005 in. Ninety-nine of these milling cutters, involving 198 surfaces, were ground in one hour.

Camshaft washers were ground on a No. 16 machine at the rate of 222 per hour (444 surfaces.) The size of piece was 3¼ x 1¼ x 3-16 in. and the material was hardened steel. Similar data are given on grinding of bar stock, milling cutter teeth, drop forgings, dies, jig castings, hard rubber disks, etc.

Standard Specifications and Methods of Test

"Standard Specifications and Methods of Test for Materials" is the title of an interesting paper presented at the first Pan-American conference on uniformity of specifications held at Lima, Peru, Dec. 23, 1924. The author is C. L. Warwick, secretary-treasurer of the American Society of Testing Materials. It is offered in reprinted form by the society with the permission of the director-general of the Pan-American Union.

The paper describes the development in the United States of standard specifications and methods of tests for materials as carried out by the A. S. T. M. The early developments in this field are referred to, followed by a description of the standardization work of the

society. The author pays some attention to the 400 standard specifications and methods of tests which have been formulated by the society and discusses the use of these standards in the industries. Mention is made of the important role of the American Engineering Standards Committee in coordinating engineering and industrial standardization work throughout the United States. The paper closes with a brief discussion of international standards and materials.

Carnegie Book on Standard Specifications

The Carnegie Steel Company, Pittsburgh, has published the tenth edition of "Standard Specifications," which gives the complete data compiled by the Association of American Steel Manufacturers, covering structural steel, boiler steel, hot-rolled bars, sheared plates, nickel steel plates, special forging quality bar steel, and various other steel products. The standard specifications of the American Society for Testing Materials, affecting a wide range of products, are also given.

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Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price.....	3.24c.	
Swedish charcoal iron bars, base....	7.00c. to 7.25c.	
Soft steel bars, base price.....	3.24c.	
Hoops, base price.....	4.49c.	
Bands, base price.....	3.99c.	
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.34c.	
Channels, angles and tees under 3 in. x ¼ in. base.....	3.24c.	
Steel plates, ¼ in. and heavier.....	3.34c.	

Merchant Steel		Per Lb.
Tire, 1½ x ½ in. and larger.....	3.30c.	
(Smooth finish, 1 to 2½ x ¼ in. and larger).....	3.65c.	
Toe-calk, ½ x ¾ in. and larger.....	4.20c.	
Cold-rolled strip, soft and quarter hard.....	7.00c.	
Open-hearth spring steel.....	4.50c. to 7.00c.	
Shafting and Screw Stock:		
Rounds and hex.....	4.00c.	
Squares and flats.....	4.50c.	
Standard tool steel, base price.....	15.00c.	
Extra tool steel.....	18.00c.	
Special tool steel.....	23.00c.	
High-speed steel, 18 per cent tungsten.....	70c.	

Sheets		Per Lb.
Blue Annealed		
No. 10.....	3.89c.	
No. 12.....	3.94c.	
No. 14.....	3.99c.	
No. 16.....	4.09c.	

Box Annealed—Black		Per Lb.
Soft Steel		
C. R. One Pass.....	3.80c. to 4.00c.	
Nos. 18 to 20.....	3.85c. to 4.25c.	4.60c.
Nos. 22 and 24.....	3.90c. to 4.30c.	4.65c.
No. 26.....	4.00c. to 4.40c.	4.75c.
No. 28*.....	4.20c. to 4.60c.	
No. 30.....		

Galvanized		Per Lb.
No. 14.....	4.10c. to 4.50c.	
No. 16.....	4.25c. to 4.65c.	
Nos. 18 and 20.....	4.40c. to 4.80c.	
Nos. 22 and 24.....	4.55c. to 4.95c.	
No. 26.....	4.70c. to 5.10c.	
No. 28*.....	5.00c. to 5.40c.	
No. 30.....	5.50c. to 5.90c.	

*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe		Per Lb.
Standard Weld		
Black Galv.....	46	29
½ in. Butt....	51	37
¾ in. Butt....	53	39
1-3 in. Butt....	48	35
2½-6 in. Lap..	44	17
7 & 8 in. Lap..	37	12
11 & 12 in. Lap.		
Wrought Iron		
Black Galv.....	4	+19
¾ in. Butt....	11	+9
1-1½ in. Butt.	14	+6
2-in. Lap....	5	+14
3-6 in. Lap..	11	+6
7-12 in. Lap.	3	+16

Bolts and Screws		Per Lb.
Machine bolts, cut thread, 40 and 10 per cent off list		
Carriage bolts, cut thread, 30 and 10 per cent off list		
Coach screws, 40 and 10 per cent off list		
Wood screws, flat head iron,		
72½, 25, 10 and 5 per cent off list		

Steel Wire		Per Lb.
BASE PRICE* ON NO. 9 GAGE AND COARSER		
Bright, basic.....	4.25c.	
Annealed, soft.....	4.50c.	
Galvanized, annealed.....	5.15c.	
Coppered, basic.....	5.15c.	
Tinned, soft Bessemer.....	6.15c.	

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High brass sheet.....	18½c. to 19½c.
High brass wire.....	18½c. to 19½c.
Brass rods.....	15½c. to 16½c.
Brass tube, brazed.....	26½c. to 27½c.
Brass tube, seamless.....	22½c. to 23½c.
Copper tube, seamless.....	23½c. to 24½c.

Copper Sheets

Sheet copper, hot rolled, 20½c. to 21½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates		Coke—14x20	
Bright Tin	Grade	Grade	Prime Seconds
	"AAA"	"A"	
	Charcoal	Charcoal	
	14x20	14x20	
IC..	\$11.25	\$8.85	80 lb.. \$6.15 \$5.90
IX..	12.85	10.85	90 lb.. 6.30 6.05
IXX..	14.40	12.55	100 lb.. 6.45 6.20
IXXX..	15.75	13.85	IC.. 6.65 6.40
IXXXX..	17.00	15.05	IX.. 7.85 7.60
			IXX.. 9.00 8.75
			IXXX.. 10.35 10.10
			IXXXX.. 11.35 11.10

Terne Plates

8 lb. coating, 14 x 20	
100 lb.	\$7.00 to \$8.00
IC.....	7.25 to 8.25
IX.....	8.25 to 8.75
Fire door stock.....	9.00 to 10.00

Tin

Straits, pig.....	61c.
Bar.....	62c. to 65c.

Copper

Lake ingot.....	16½c.
Electrolytic.....	16½c.
Casting.....	16 c.

Spelter and Sheet Zinc

Western spelter.....	9¼c.
Sheet zinc, No. 9 base, casks.....	12½c., open 13c.

Lead and Solder*

American pig lead.....	9¼c. to 11¼c.
Bar lead.....	11c.
Solder, ½ and ½ guaranteed.....	39½c.
No. 1 solder.....	36½c.
Refined solder.....	30c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

Antimony

Asiatic.....	20c. to 21c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	38c.
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Old Metals

The market is strong and business is improved. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible.....	11.75
Copper, heavy wire.....	11.00
Copper, light bottoms.....	9.25
Brass, heavy.....	7.00
Brass, light.....	5.75
Heavy machine composition.....	8.75
No. 1 yellow brass turnings.....	8.00
No. 1 red brass or composition turnings.....	8.00
Lead, heavy.....	6.50
Lead, tea.....	5.25
Zinc.....	4.25
Cast aluminum.....	17.00
Sheet aluminum.....	17.00

